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Performance Management and Performance Appraisal are different

Example:

Performance Management

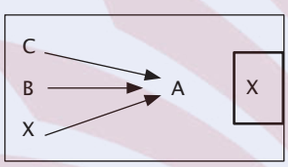
X => Manager
A => Executive
B => S. Executive
C => Executive

Weekly seminar on different topics of GST B

(Mutually Decided)

Example:

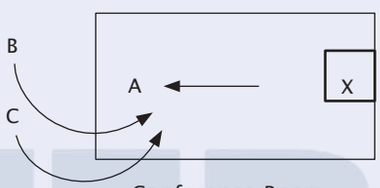
A => Work's Contact
B => Coaching
C => Road Transport



Conference Room

Performance Appraisal

1. One by one ratings given by Manager but promotion enclosed by HR
2. Bonus by HR.
3. KPMG
4. HR disclose => 31/2/21

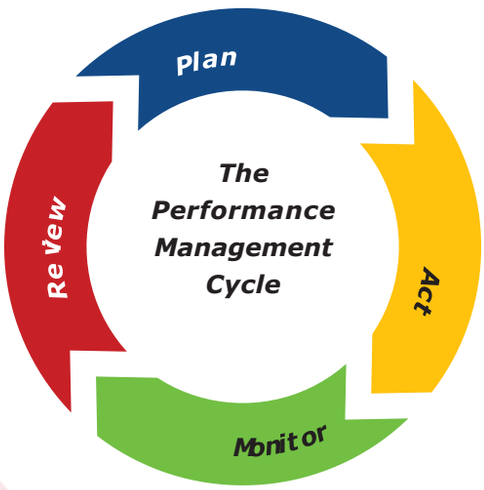


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PM focuses on achievement of result



Components of Performance Management

1. ***Plan*** => *KPI, KPA (BSC drills down) both employee and reporting officer are involved. Both reporting officer* and appraiser are involved.

   Ironore Excavation / Mining Company

   Washed √
   Unwashed √
   Fines √

   KPI's -> Output per man shift
   Total Output
   Cost per ton

2. ***Per Appraisal***

   Twice / Once

   Self-Appraisal forms are filled / Self Ratings

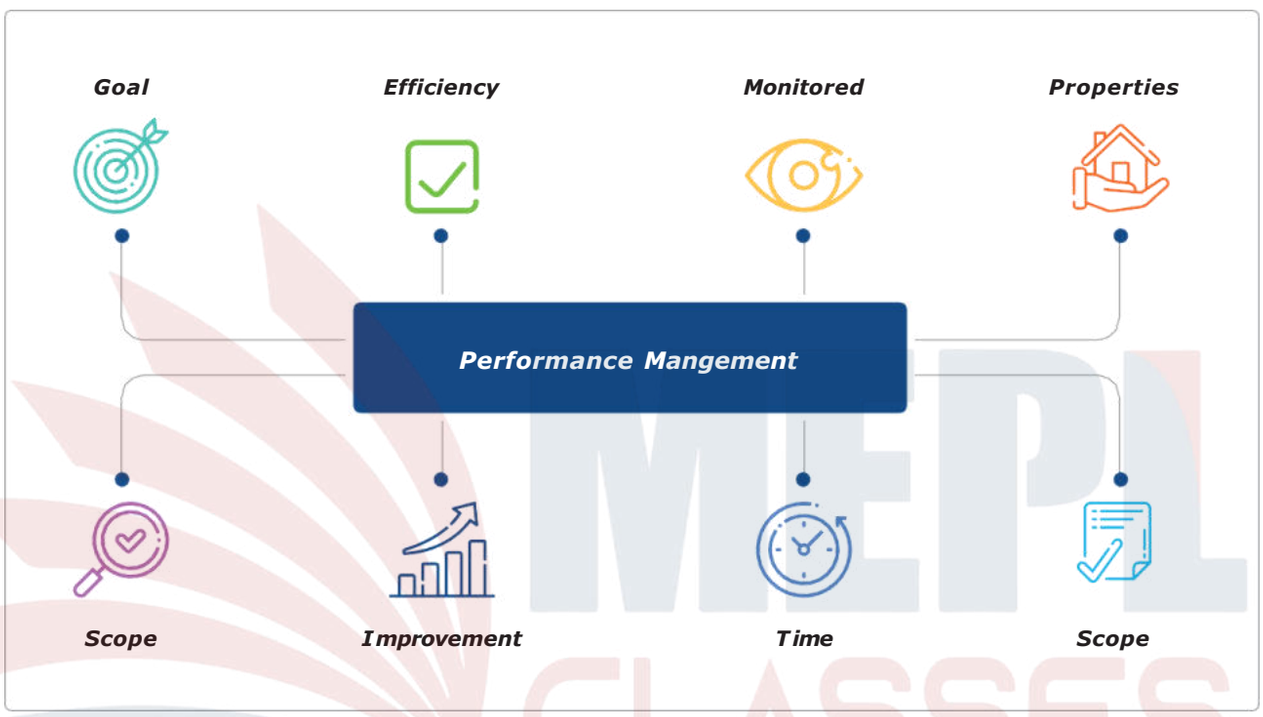
3. Performance Counselling / Feedback
4. Rewarding for Good Performance => Publically Rec (Bonus, Salary Hike, Best Employee of the year)
5. Performance Improvement Plan (Jointly by appraiser and appraise) (New deadline / fresh targets)
6. Potential Appraisal

   Lateral: My friend having interest in Audit Joined IDT theory in appraisal shifted to Audit team (potential satisfactio n by Job Relation)

   Vertical: No growth in current GST as in Kolkata. GST works are less, demanded to transfer in Mumbai. So same post transfer to Mumbai but growth prospect in future these-----So Success Planning.

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Performance will be the product of efficiency, utilization and productivity



1. Performance Planning

Performance planning is jointly done by the appraiser and the reviewer in the beginning of a performance session. During this period, the employees decide upon the targets and the key performance areas *which can be performed over a year within the performance budget, which is finalized after a mutual agreement between the reporting officer and the employee.*

KPIs for Managing Director of the above company may include the following:

a) Grade-wise production of iron ore in tonnages for the year in question

b) Output per man-shift (OMS)

c) Equipment utilization %

d) Cost per ton of each grade for the year in question

2. Performance Appraisal and Reviewing

After the self appraisal, the final ratings are provided by the appraiser for the quantifiable and measurable achievements of the employee being appraised. The entire process of review seeks an active participation of both the employee and the appraiser for analyzing the causes of loopholes in the performance and how it can be overcome.

3. Feedback on the Performance followed by personal counseling and performance facilitation:

This is the stage in which the employee acquires awareness from the appraiser about the areas of improvements and also information on whether the employee is contributing the expected levels of performance or not. The employee receives an open and a very transparent feedback and along with

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this the training and development needs of the employee is also identified.

4. ***Rewarding good performance:***
   An employee is publicly recognized for good performance and is rewarded
5. ***Performance Improvement Plans:***
   This plan is jointly developed by the appraise and the appraiser and is mutually approved.
6. ***Potential Appraisal***
   Lateral and vertical movement succession planning and job rotation.

Performance, Productivity and Efficiency

1. This could lead to increases or decreases in shareholders 'wealth.

2. At a basic level, productivity examines the relationship between input and output in a given production process.
3. Output(s) Productivity =Output(s)/input(s).....(1)
4. *The highest productivity level from each input level is recognized as the efficient situation.*
5. *Alternative ways of improving the productivity of the firm, for example, are by producing goods and* services with fewer inputs or producing more output from the same quantity of inputs.
6. *Performance will be product of efficiency, utilisation and productivity.*
7. *Efficiency consists of two main components; technical efficiency and allocative efficiency. Generally, the term efficiency refers to technical efficiency. As discussed in the previous section, technical efficiency occurs if a firm obtains maximum output from a set of inputs.*
8. *When a firm fails to choose the optimal combination of inputs at a given level of prices, it is said to be allocatively inefficient, though, it may be technically efficient.*

   - To illustrate the above, let us consider a ferro-alloy plant manufacturing ferro-chrome with chrome ore, coke and limestone as chief inputs. Suppose it can produce 6,000 tons of ferro-chrome of a *specific grade in a day with least cost per ton, if 15,000 tons of domestic ore and 3,300 tons of* imported coke of appropriate grades are available at agreed prices (assume requisite limestone is sourced from captive mines). Let us consider the following scenarios:

     If inputs as above are available, any adverse deviation in output is attributable to technical inefficiency.

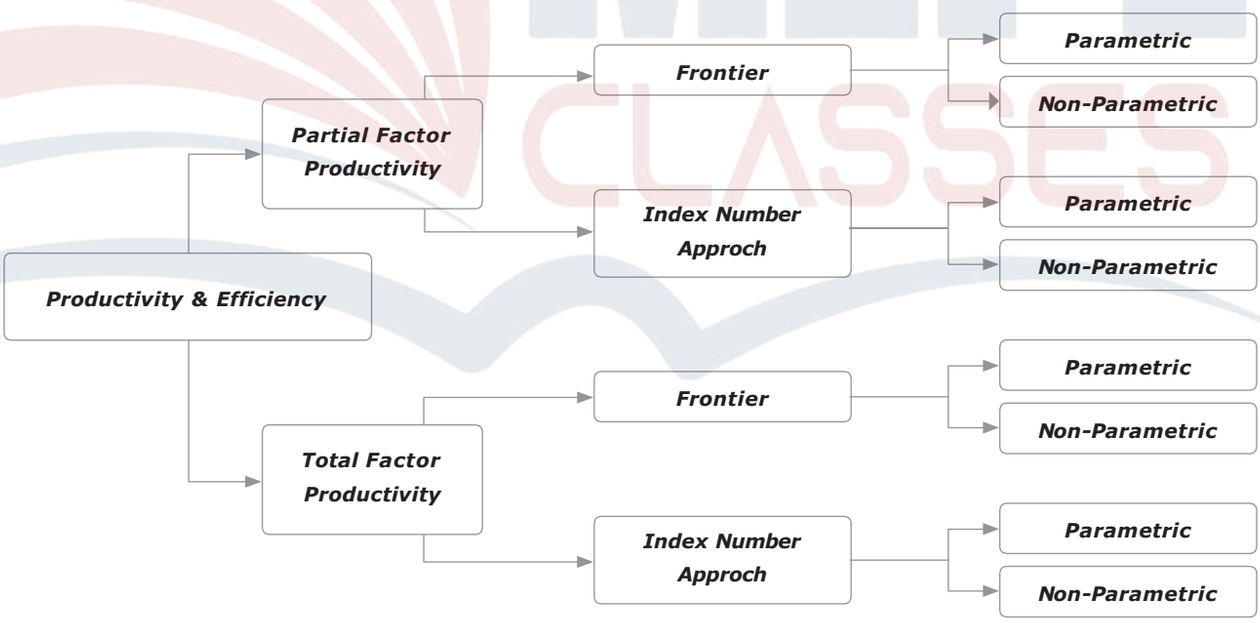
   - Suppose, on a particular day imported coke is out of stock and 3,500 tons of domestic coke is *purchased as a cheaper substitute though with lower yield. This is an allocative inefficiency resulting* in higher cost per ton of ferro-chrome [Note: Higher quantity of domestic coke is required for compensating lower yield, entailing adverse cost. Rush purchases further add to cost].

   - Suppose, there is a breakdown of machinery in limestone mines on a day.

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9.

10. Fig: Approaches to the measurement of Productivity and Efficiency



11. A comprehensive example of TFP is Return On Investment (ROI) or overall profitability index which can be broken up into several parts through product profitability and capital turnover rate.

12. The output is only a measure of the joint power of inputs to achieve results. This is the main disadvantage of measuring productivity and efficiency using the PFP approach. To overcome this shortcoming of PFP, TFP has been developed. TFP measures overall productivity and efficiency by considering all inputs and all outputs in the production process.

Improvement in Productivity?

1.More output in same input

OR

2. Same Output in Reduced output?

Example:

Input	***Ouput***
100 Kg	200 Kg => 2.1

2) Efficiency

100 Kg	300 Kg => 31
50 Kg	200 Kg => 20:5 (4:1)

1st case: *All 3 input combination but output 15000 => Technical Inefficiency*

A. 1500 units
B. 3000 ton
C. 1000 ton

→ Ferrochrome 16000 tons Cost per ton 2000 (Maximum production at least cost)

2nd case: All

A. 1500 units
B. 3000 ton
C. 1000 ton

→ 16000 tons

Cost per ton 2050 (?)

Although technical efficient but allocative inefficiency

3rd case:

A. 1500 units
B. 3000 ton
C. 1000 ton

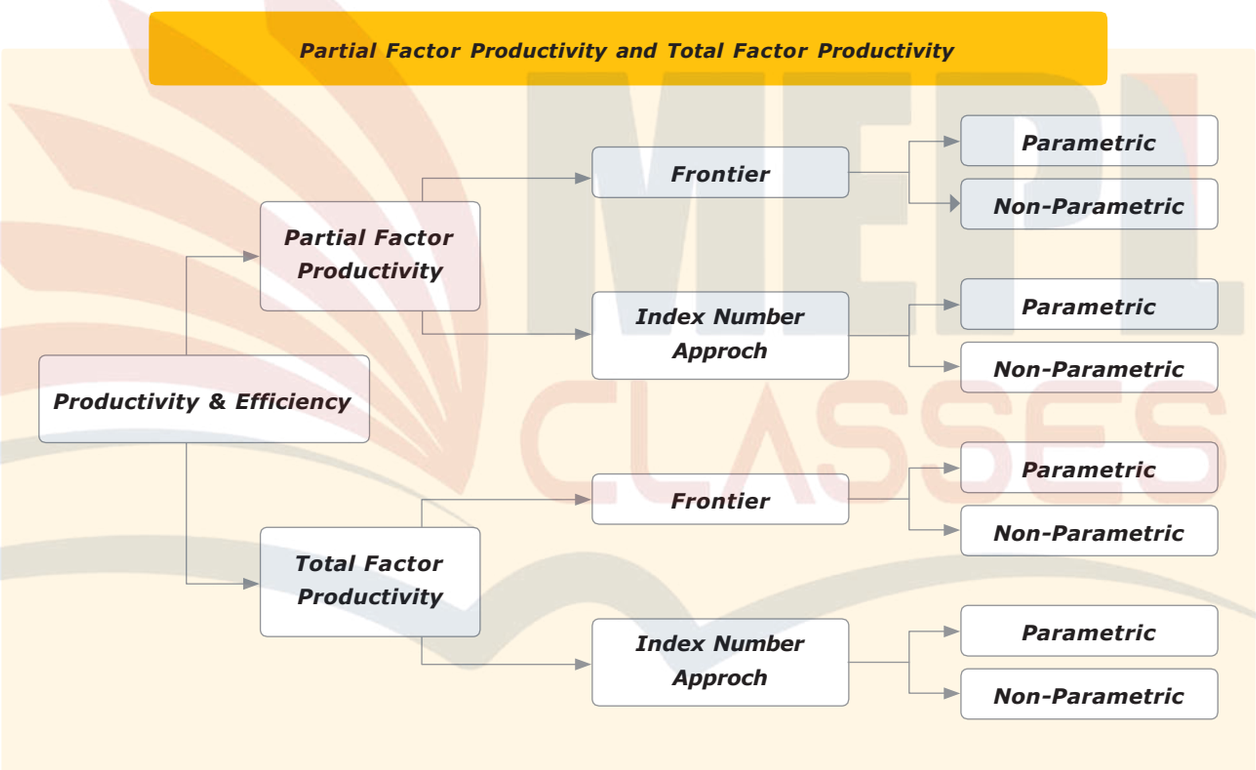
→ 15000 tons [both Allocative and Technical *Inefficiencies]*

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Measurement of Productivity and Efficiency

1. **Partial Factor Productivity**
   (Change in Output due to change in 1 Input)
   Eg => Output per normal hours, material yield

2. **Total Factor Productivity**
   (Change in output due to change in more than 1 input)
   Eg. => ROI



Financial Performance Analysis

Why?

- To identify financial strength and weakness of the firm.
- Growth of the company can be identified.
- Analysis of firm's financial position
- Helps in short term and long term forecasting.

How?

- By establishing Relationship between item of B/L and P/L Account.

Done by whom?

1. Management or 2. Creditors or 3. Investors or 4. Shareholders or 5. Tax Authorities

Financial analysis involves use of financial and statements

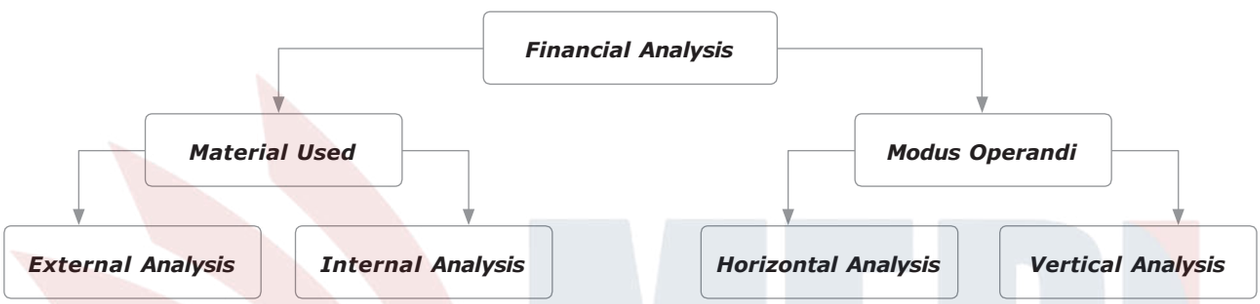
1	B/S: Total Asset => Total Liability + Owner's Equity
2	P/L or Income Statement => NP or NL
3	Cash Flow Statement => Direct & Indirect Method Accepted

Areas of Financial Performance Analysis

Working Capital Analysis	***Working Capital Analysis***	***Working Capital Analysis***	***Working Capital Analysis***
Helps to determine liquidity of the company. CA =Debtor CL =Trade Payables Trade Cash Bank/BR ***Current Ratio*** $= \frac{CA}{CL}$ Highest the better	Evaluates how much is debt and how much is equity. ***Debt Equity Ratio*** $\frac{\text{Debt}}{\text{Shareholder's Equity}}$ Lower the better If less than 1 means good as assets are funded by equity and debt is less. ***Ideal Ratio*** =0.3 – 0.6	*Means/identifies cash flow from:* a) Operation Activities b) Investment Activities c) Financing Activities d) Legal Analysis Director	*Identify the profit of* ***1) N/P Ratio*** $= \frac{N/P}{\text{Sales}}$ Highes the Stock in ratio means positive return and is good. N/P =G/P + Indirect Income – Indirect Expense ***2) ROE*** $= \frac{\text{Net Income}}{\text{Shareholder's Equity}}$ Net Income=N/P before dividends paid to Common Shareholders and Interest to lenders. Highes the Ratio means growth. ***2) P/E Ratio*** $= \frac{\text{Share Price}}{\text{Equity per Share}}$

Significance of FPA (Done for whom)

1. *Trade Creditors (interested in liquidity of the firm)*
2. *Bond Holders (interested in cash flow ability of the firm)*
3. Investors (interested in present and expected earnings)
4. *Management (interested in internal control, better financial condition, better financial performance)*



Types of FPA:

Material Used

1. ***External Analysis:*** Uses published F/S Like B/S, P/L of Annual Reports) done by outsiders like Investors, Creditors, Government.
2. ***Internal Analysis:*** *Done by employees, executives or Officers appointed by court or Government who* have access to any books of A/Cs.
3. ***Horizontal Analysis/Dynamic Analysis****: F/S of years are reviewed / CY's figures compared with base* years (Many A/C years)
4. ***Internal Analysis:*** Helps to compare performance of several companies in same groups or departments in same company. (Data of only (1) A/C year)
   Eg: Money control peer Comparison.

Techniques of FPA:

1. ***Many => Cash Flow, Fund Flow, Ratio, Trend Analysis, Common Size F.S***
   Ratio Analysis (4 Ratio)

Liquidity Ratios	*Profitability Ratios*	*Capital Structure Ratios*	*Activity Ratios*
$C.R = \frac{CA}{CL}$ ***Quick Ratio*** $\frac{CA - Stock}{CL}$	GP Ratio N/P Ratio EPS Ratio ROE	Debt Equity	Debtors Turn Over Stock Turn Over ***Inventor*** $\frac{\text{Credit Sales}}{\text{CL Average Debtors}}$

2. *Common Sized F.S*

For comparing F.S of different years of same companies.

For comparing F.S of different. sized companies.

$$\text{Common Size Ratio} = \frac{\text{Iteam of Interest}}{\text{Refused Iteam}} \times 100$$

3. *Prepared For Income Statement and B/S*

1. Common Size I.S
2. Common Size B/S

Example:

Income Statement		***Rs. (Cr.)***	***CS I.S***
1	Revenue	1000	100%
2	COGS	800	80%
Gross Profit		***200***	***20%***
Balance Sheet		***Rs. (Cr.)***	***CS B/S***
1	Fixed Assets	150	$\frac{150}{200} \times 100 = 75\%$
2	Current Assets	50	$\frac{150}{200} \times 100 = 25\%$
Total Assets		***200***	***100%***
Liabiliies		***Rs. (Cr.)***	***C/S B/S***
1	Current Liabilities	100	50%
2	Shareholder's Equity	75	37.5%
3	Debentures	25	12.5%
Total Liabilities		***200***	***-***

Cross Sectional Analysis (B/W Companies)

For Benchmarking

Limitations:

1. Different A/C Policies
2. Different A/C Calendars (1st Jan – 31st Dec) or (Mar – Apr)
3. Trend Analysis: Change in item over a period of time

Base Year – 100 $\frac{P_1}{P_0} \times 100$ Index numbers

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Supply Chain Management

a. Definition

Supply chain management is a set of approaches utilized to efficiently integrate suppliers, manufactures, warehouses and stores, so that merchandise is produce and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements.

b. Components of SCM

Component of Supply Chain Management: There are five basic components of Supply Chain Management. These are showing in the diagram:

Plan : This is the strategic portion of SCM. You need a strategy for managing all the resources that go toward the meeting customer demand for your product and services.

Source : Choose the suppliers that will deliver the goods and services you need to create your product. Develop a set of pricing, delivery and payment processes with suppliers and create metrics for monitoring and improving the relationships.

Make : This is the manufacturing step. Schedule the activities necessary for production, testing, packaging and preparation for delivery.

Delivery : This is the part that many insiders refer to as logistics. Coordinate the receipt of orders from customers, develop a network of warehouses, pick carriers to get products to customers and set up an invoicing system to receive payments.

Return : The problem part of the supply chain. Create a network for receiving defective and excess products back from customers and supporting customers who have problems with delivered products.



c. Development of Supply Chain Management:

d. Loopholes in SCM

1. Matching Supply and Demand: It is a major challenge:

2. Inventory and back – Order levels fluctuate considerably across the supply chain: Even when customer demand for specific products does not vary greatly.

3. Forecasting does not solve the problem: Indeed, we will argue that the first principle of forecasting is that "Forecasts are always wrong." Thus, it is impossible to predict the precise demand for a specific item, even with the most advanced forecasting technique.

4. Demand is not the only source of uncertainty: Delivery leads times, manufacturing yields, transportation *times, and component availability also can have significant chain impact.*

5. Recent trends such as lean manufacturing, outsourcing and off shoring that focus on cost reduction *increases risk significantly.*

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CRM (Customer Relationship Management)

1 Defination:

CRM is a business strategy comprised of process, organizational and technical change whereby a company seeks to better manage its enterprise around its customer behaviors. It entails acquiring and deploying knowledge about customers and using this information across the various customers touch points to *increase revenue and achieve cost reduction through operational efficiencies.*

- Understand the customer
- Retain customers through better customer experience
- Attract new customer
- Win new clients and contracts
- *Increase profitably*
- Decrease customer management costs

2. Parts of CRM:

a.



b.Analytical CRM: The purpose of analytical CRM is customer data analysis, its evaluation, modeling and prediction of customer behaviour. In real life situation the analytical CRM can for example gather all the *data about customers inquiring a specific product by using data mining (tool for data gathering), what* services they purchased right away and what services they purchased eventually.

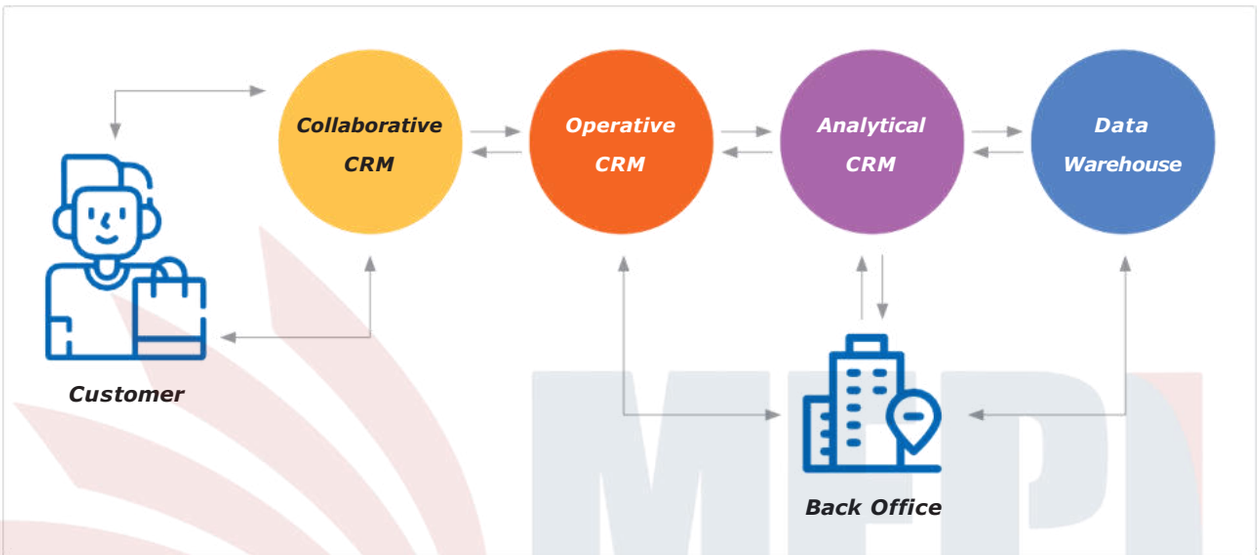
c.Operative CRM: Operative CRM mainly supports the actual contact with customers conducted by front *office workers and general automation of business processes including sales of products, services and* marketing. All communication with the customer is tracked and stored in the database and if necessary it is effectively provided to users (workers). The advantage of this approach being the possibility to communicate with various employees using various channels but creating the feeling that customer is being taken care of by just one person.

d.Collaborative CRM: Collaborative CRM enables all companies along the distribution channel, as well as all departments in a company, to work together and share information about customers, even speaks about partner relationship management (PRM). But sometimes we might see a rivalry between departments that undermines efforts of CRM to share relevant data throughout the whole company (e.g. information from help line can help the marketing department choose a point on which it will focus during the next campaign). Information technology plays an important role in the concept of CRM. Without its smooth function the *modern CRM would be unimaginable. The information is sent to operative component where front office workers put it into use. It allows that information to be used for efficient and personalized interaction with clients. These three steps are observed by back office workers which influence them and are influenced* by them (e.g. creation of a new suitable product). Information from operative CRM is readily available to any employee through collaborative CRM.

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3. Principles of CRM:

Technological aspects and principles of CRM



4. Objectives of CRM:-

Objectives for using CRM applications

Objectives of using CRM Applications, defined in the following line:

I. To support the customer services

II. To increase the effectiveness of direct sales force.

III. To support of business to business activities.

IV. To support of business to consumer activities.

V. To manage the call center.

VI. To operate the In- bound call centre.

VII. To operate the Out - bound call centre.

VIII. To operate the Full automated(i.e. no CRM involvement, "lights out")

5. Advantages and benefits of CRM:

- *satisfied customer does not consider leaving*
- *product development can be defined according to current customer needs*
- a rapid increase in quality of products and services
- the ability to sell more products
- optimization of communication costs
- proper selection of marketing tools (communication)
- trouble-free run of business processes
- greater number of individual contacts with customers
- more time for customer
- differentiation from com petition

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6. CRM RISK:

An overwhelming 91 percent of the respondents indicated that risk management is either a very important (55 percent) or moderately important (36 percent) aspect to their CRM projects. Why is it so important? Look at some of the impacts that a CRM initiative may have on an organization:

1. ***Definition of Risks Impacting a CRM Solution***
2. ***Customer dissatisfaction/loss of customers (27 percent)***
3. ***Data integrity is compromised/security (15 percent)***
4. ***Inability to meet objectives/ benefits not realized (13 percent)***
5. ***Risks to the business in general (13 percent)***
6. ***Events and circumstances that could affect the implementation (12 percent)***
7. ***Loss of competitive advantage (6 percent)***
8. ***Legal considerations (4 percent)***
9. ***Lack of controls (4 percent)***
10. ***Negative impact on business reputation (2 percent)***
11. ***Loss of market share (2 percent)***
12. ***Acceptance of CRM within the organization (2 percent)***

Determining Risk Tolerances

Now that risk management has been established as important to organizations, which risks should be tolerated? The methods and approaches to determining the organizations' tolerance to CRM risks are as varied as the organizations themselves. When asked how they determine their risk tolerances, 32 percent of organizations indicated informal methods such as arbitrarily assigning risks a high, medium or low rating based on common sense or their intuition. Surprisingly, 22 percent of the organizations did not determine or calculate their risk tolerance. And on the other side of the spectrum, 14 percent of the organizations *use statistical analysis methods. The statistical analysis methods also varied significantly, but some of the* more common methods include:

- Ratio of potential losses to the potential plus actual sales revenues generated
- Grade of impact multiplied by the number of times of one action
- Risks multiplied by the costs to prevent the risks
- Cost of total risks divided by the total revenue
- Probability multiplied by impact by timescale to equal risk priority
- Multiplying a factor of the probability of the risk happening and the qualitative estimate of the damage it will cause

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Customer Profitability Analysing

Typically traditional cost accounting is not able to identify product and service costs or distribution and delivery costs for individual customers. ABC can help identify customer activities and track those costs *that are allocated to specific customers. This can provide management with unique information about customers and customer segments. The benefit includes:*

1. *Protecting existing highly profitable customers*
2. Reprising expensive services, based on cost-to-serve
3. Discounting to gain business with low cost- to-serve customers
4. Negotiating win-win relationships that lower service costs to co-operative customers
5. Conceding permanent loss customers to competitors
6. *Attempting to capture high-profit customers from competitors.*

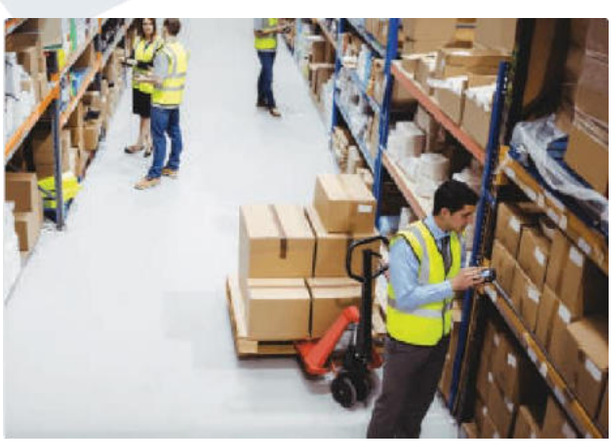


Customer profitability analysis has become an important new management accounting tool based on recognition that each customer is different and that each dollar/pound of revenue does not contribute equally to the *firm's profitability. Customers utilize company resources differently; thus* customer costs vary from one customer to another. The following issues *should be considered when analyzing customer profitability:*

1. How to develop reliable customer revenue and customer cost information
2. How to recognize future downstream costs of customers
3. How to incorporate a multi-period horizon in the analysis
4. How to recognize different drivers of customer costs.

These currently hidden customer costs may include items such as:

1. Inventory Carrying Costs
2. Stocking and handling costs
3. Quality control and inspection costs
4. Customer order processing
5. *Order picking and order fulfillment*
6. Billing, collection and payment processing costs
7. Accounts receivable and carrying costs
8. Customer service costs
9. Wholesale service and quality assurance costs
10. Selling and marketing costs.



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Risk tolerance of CRM level

expected rev > expected losses due to the CRM Risk

ABC ANALYSIS:-

CUSTOMER PROFITABILITY ANALYSIS

Company XYZ Ltd. is dealing in manufacturing of Automative Batteries used in commercial vehicles.The company has made a sale of total 6,00,000 pcs of batteries during the year 20-21.The sale yours mainly made to 4 types of customer.ie. Govt. co.s (tender based),Maruti udyog,Hyundai India & industrial companies.Following are the further details:-

Particulers	GOVT.	HYUNDAI	MARUTI	INDUSTRY
Units sold pa.	1,00,000	1,50,000	2,50,000	1,00,000
Price p.u (f)	10/-	6.5/-	5/-	8/-
No.of sales visit	0	1/month	1/month	1/month
Payment follow up visit	5/ month	2/month	2/month	2/ month
Distance from factory	100 km	150 km	100 km	200 km

The company makes delivery with only company vehicle which can take a maximum of 1500 box of batteries & has a running cost of ` 22/km.The sales person takes `5000 per visit & payment follow up takes `1000/visit. *Calculate profit per customer as per ABC analysis.*

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SPM CMA FINAL CHAPTER-2 BSC & DUPONT

DU PONT ANALYSIS	ABC Ltd.		XYZ Ltd.	
PARTICULARS	YEAR 1 ₹ (LAC)	YEAR 2 ₹ (LACS)	YEAR 1 ₹ (LACS)	YEAR 2 ₹ (LACS)
Net Income	1000 ✓	1200 ✓	2,100	2100
Revenue	10,000	10,000	17,500	17500
PROFIT MARGIN	0.1 ✓	0.12 ✓	0.12 ✓	0.12 ✓
Revenue	10,000	10,000	17,500	17,500
Avg. Assets	5000 ✓	4800 ✓	8750	8750
ASSET TURNOVER	2	2.08 ✓	2	2
Avg. Assets	5000 ✓	4800 ✓	8750	8750 ✓
Avg Equity	2000 ✓	2000 ✓	5000	3500
FINANCIAL LEVERAGE	2.5	2.4	1.75	2.5
ROE	50% ✓	60% ✓	42% ✓	60%

Q). In which company an investor should inv

Total Asset = Total Liab
Debt 3000
Equity 2000
5000

Debt 2880 · 2400
Equity
4800

(10MD 8pm)

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CHAPTER -2

(Performance Evaluation & Improvement Tools)

1987 ie Art Schneiderman

- BSC
- Dupont Analysis

Robert S Kaplan & David Norton

BALANCE SCORE CARD

- Identify Org. Mission Statement.
- Goals & objectives → (profitmax)
- KPI → N/P Margin (-7-/- of sales.)

→ 4 perspectives:

1) financial perspective.
2) Customer perspective.
3) Internal Bus Process
4) Growth & learn. → employee

BSC.

financial perspective	objectives	KPI	Target	Actual
	i) Profit Max	N/P	7-/- of sales	
	ii) Cost Reduce	cost per tonne.	₹ 2000.	

CUS

DNHC. Market Cap- 20+.

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Benefits of BSC :-

1) long term insight to the managem.
2) helping the functional heads to under. about the corporate strategies.
3) Stakeholders
4) Per Mgmt.
5) Budget

DUPONT ANALYSIS

ROE ⇒ Return on Equity

- Operating Efficiency + Eg ⇒ N/P Ratio
- Asset Efficiency Eg Asset Turnover
- Financial Leverage. Assets / Equity.

$$\frac{\text{Net Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$$

$$\Rightarrow \frac{\text{Net Profit}}{\text{Equity}} = \text{ROE}$$

1 × 2 = N/P / Asset ⇒ ROA

ROE = ROA × Equity Multiplier

RESTAURANT BALANCED SCORECARD EXAMPLE

—— BARBQ PIZZA & PASTA ——

ADDRESS	141 BK PAUL AVENUE	CITY	KOLKATA	STATE	WB	ZIP	700007

	STRATEGIC OBJECTIVES	KEY PERFORMANCE INDICATORS	TARGETS			INITIATIVES	
			CURRENT	INTERVAL	NEXT	PROGRAMS	BUDGETS
FINANCIAL	Increase company profitability	% Net profit margin	7%	Q	12%	N/A	N/A
		$ Net cash flow	22.101	M	24		
	Optimize revenue and expenses	$ Sales to date	30.564	Q	35.05		
		$ Cost per call	0.24	M	0.12		
CUSTOMER	Maintain high levels of customer satisfaction	% Survey excellent score	32%	Q	50%	Begin customer rewards project Project to train employees on new customer rewards	$5,000.00 initiative 0.5 hour per employee
		% Call abandon rate	16%	M	10%		
	Increase customer profitability	$ Revenue per client	300	M	350		
		$ Average new customer acquisition cost	12	M	5		
	Build and improve the customer network	# New customers	315	M	350		
		% Market share	6%	Q	10%		
INTERNAL PROCESSES	Increase call-handling expertise	Average call-handling time	315	M	350	Training for call handlers Review the service delivery process	0.25 hour per call handler 5.0 hours manager
		% Scheduling adherence	6%	Q	10%		
	Improve service delivery	% Processes optimized	9	M	7		
		% Active projects running on time	75%	M	85%		
		and on budget	50%	M	55%		
			50%	M	50%		
LEARNING	Build a culture that encourages innovation	# Employee engagement index	27	Q	40	Ask for and reward employee ideas that improve processes Write up employee innovations in the company newsletter Determine bonus structure for successive years of service Group to decide rewards for completed training programs	$25/idea, $500/success idea Groups: 5 hours manager 1 hour manager
		# Ideas received for new/improved service from employees	25	M	25		
	Nurture high-performing employees	% Employee satisfaction	75%	Q	85%		
		% Employee turnover	9%	M	5%		
	Continuously improve skills and competence	# Training hours per full-time equivalent	15	M	18		
		% Employees meeting professional development requirements	72%	Q	85%		

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BALANCED SCORECARD FOR HEALTHCARE EXAMPLE

— MERCY HOSPITAL —

MISSION	Our hospital brings health and healing to the community.	VISION	Our hospital will be the best place to work and get health care.

		STRATEGIC OBJECTIVES	KEY PERFORMANCE INDICATORS	TARGETS	INITIATIVES
FINANCIAL	To sustain our mission financially, what should our focus be?	Demonstrate accountability and efficiency	% Alternative level of care patients	<15%	
			% Nursing purchased service worked hours	80%	
			Absenteeism rate	<7%	
STAKEHOLDERS	How should we appear to our stakeholders?	Overall patient satisfaction	Overall rating of care	75% good or better rating	Management staff leadership initiative Develop charter for community group
		Patient perception of quality index	% Family physicians that receive discharge summaries	90%	
			Employee and physician engagement	As per survey, >50%	
			Community consultation measures	Meet 8 of 10	
INTERNAL PROCESSES	At which internal processes should we excel to better serve our patients?	Processes are patient centered, focused on quality and patient safety	%Medication reconciliation on admission	95%	Revamp infection-reporting process Converge report form review group
			Rate of inpatient falls	<5%	
			Surgical safety compliance checklist	98% completed	
			% Compliance with hand hygiene policy	95% compliant	
			# Publicly reported infection measures	5 per month	
LEARNING	How should we better develop our systems to serve our patients?	Enhance and maintain a healthy work environment	Vacancy rate	3%	Hire new HR lead
		%Performance development plans completed	%Performance development plans completed	80% by end of quarter	
		# Grievances received and resolved prior to arbitration	# Grievances received and resolved prior to arbitration	05-Apr	
		Leader learning development	Leader learning development	100% completion rate	

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STATISTICAL QUALITY CONTROL

P-Chart Sums :→ [Control Charts for Attributes]

DAYS	No. Of Invoice	Defective	Fraction (-/.)
1	100	22	22-/.
2	100	24	24-/.
3	100	26	26-/.
4	100	28	28-/.
5	100	24	24-/.
6	100	20	20-/.
7	100	18	18-/.
8	100	20	20-/.
9	100	29	29-/.
10	100	32	32-/.
	$\Sigma n = 1000$	$\Sigma p = 243$	

STEP 1 : $\bar{p} = \frac{\Sigma p}{\Sigma n} = \frac{243}{1000} = 0.243$

STEP 2 : $\bar{n} = \frac{1000}{10} = 100$

STEP 3 : UCL $\Rightarrow \bar{p} + z\sigma_p$ (where $z = 3$)

$$= \bar{p} + z\sqrt{\frac{\bar{p}(1-\bar{p})}{\bar{n}}}$$

$$= 0.243 + 3\sqrt{\frac{0.243(1-0.243)}{100}}$$

$$= 0.243 + 3 \times \sqrt{0.00183951}$$

$$= 0.37$$

$$= 37.17-/.$$

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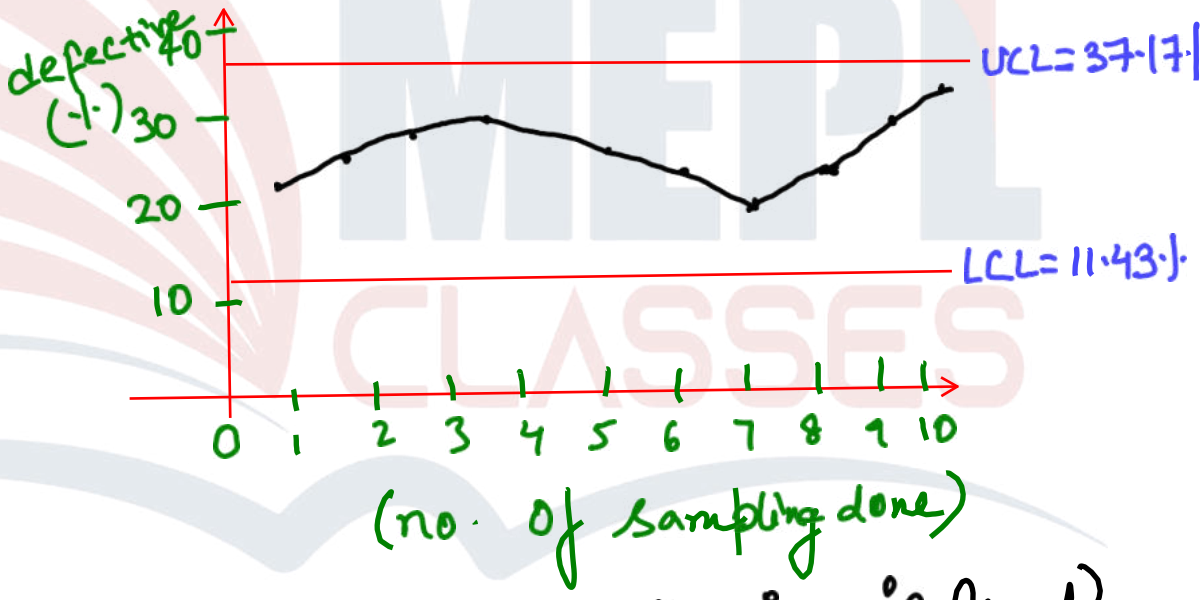
Step 4: $LCL = \bar{p} - z\sigma_p$

$$= \bar{p} - z\sqrt{\frac{\bar{p}(1-\bar{p})}{n}}$$

$$= 0.243 - 3 \times \sqrt{0.0018395}$$

$$= 11.43\%$$

Step 5: → P- CHART



② C-CHART :→ (used when sample size is fixed).

Step 1 → find $\bar{c}$, where c is the no of defects per sample/units

Step 2 → find UCL = $\bar{c} + z\sqrt{\bar{c}}$ (where z = 3)

Step 3 → find LCL = $\bar{c} - z\sqrt{\bar{c}}$

③ R- CHART & X bar CHART (Control Charts for variables)

	SAM-1	SAM-2	SAM-3	SAM-4	SAM-5
	11.1	10.1	9.8	11.2	11.2
	9.2	11.2	10.2	10.1	9.4
	11.3	9.9	9.9	10.1	8.9
$\bar{X}$	10.5	10.4	10	10.5	9.8
R	2.1	1.3	0.4	1.2	2.3

R- Chart

Step 1 → $\bar{R} = \frac{2.1+1.3+0.4+1.2+2.3}{5} = 1.46$

Step 2 → $UCL = D_4(\bar{R})$

$= 2.57 \times 1.46$

$= 3.75$

Where D_4 = (value of constant, based on sample size)

suppose $D_4 = 2.57$

$LCL = D_3(\bar{R})$

$= 0 \times 1.46$

$= 0$

4) $\bar{X}$ chart

step 1: → find $(\bar{\bar{X}}) = \frac{10.5+10.4+10+10.5+9.8}{5}$

$= 10.24$

step 2: → $UCL = (\bar{\bar{X}}) + A_2(\bar{R})$

$= 10.24 + 1.02(1.46)$

$= 11.73$

(Where A2 = constant based on sample size 1.02)

step 3: → $LCL = (\bar{\bar{X}}) - A_2(\bar{R})$

$= 10.24 - 1.02(1.46)$

$= 8.75$

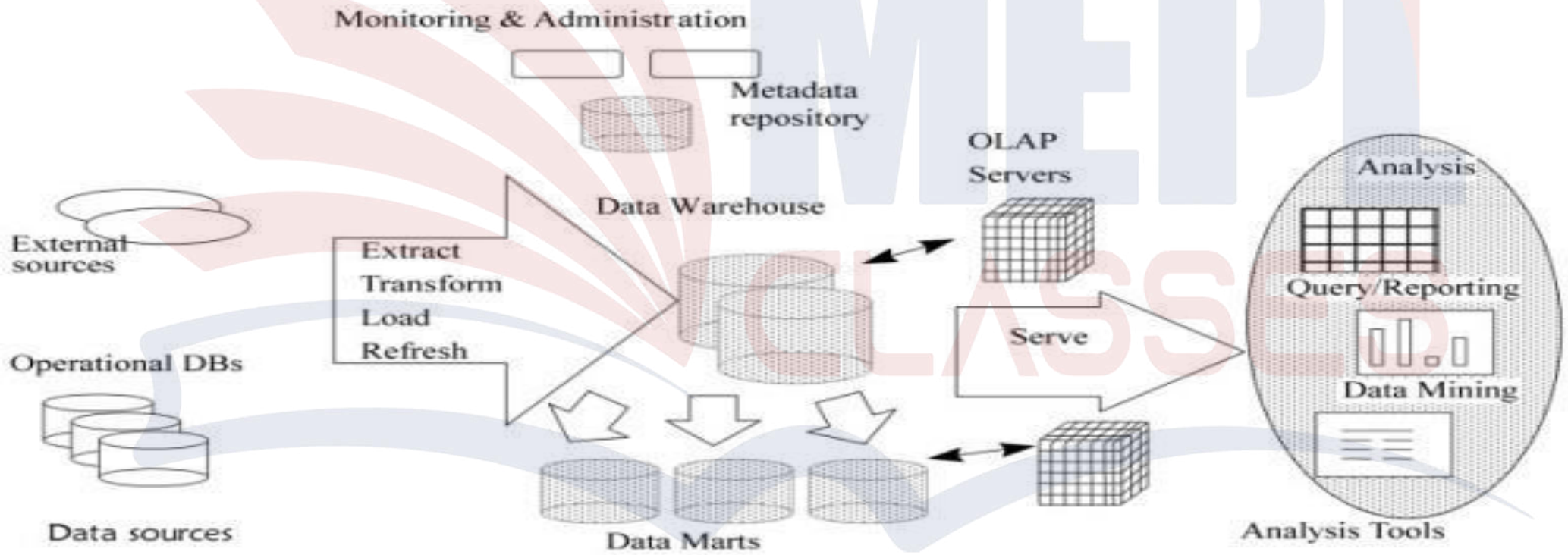
Note:→ A2, D3, D4, Z are constants, value of which is derived from control charts & is not in syllabus.

ONLINE ANALYTICAL PROGRAMME (OLAP)

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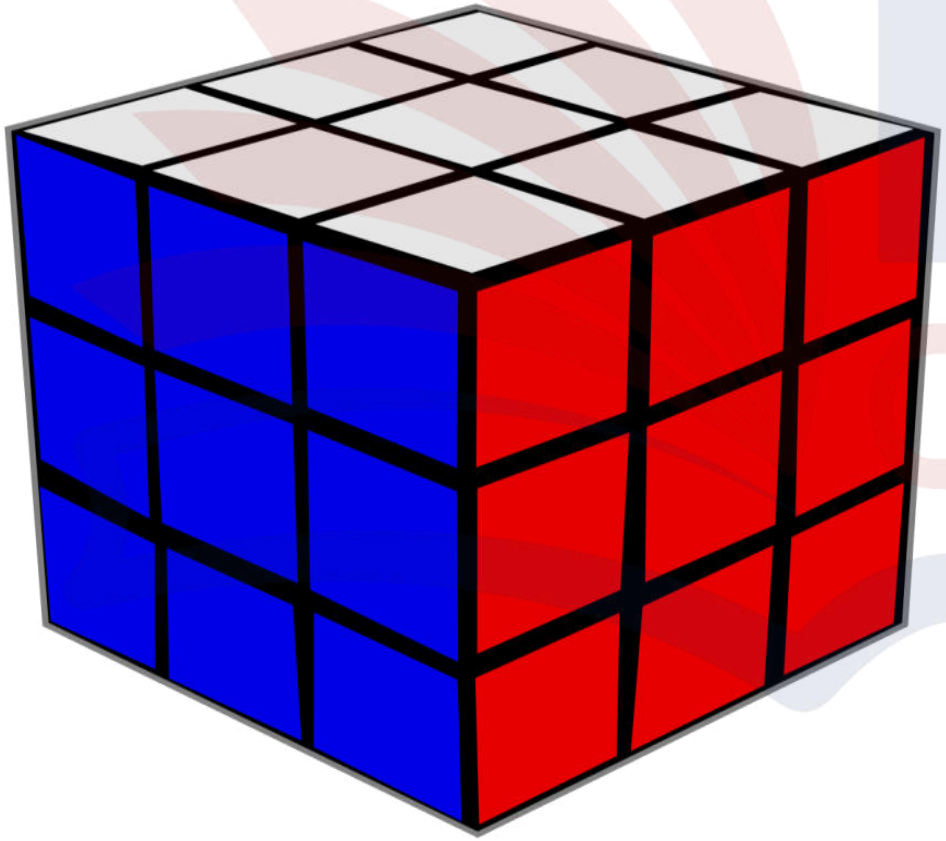
WHAT IS OLAP

MULTIDIMENTIONAL DATA ANALYSIS TOOL FOR DECISION MAKING



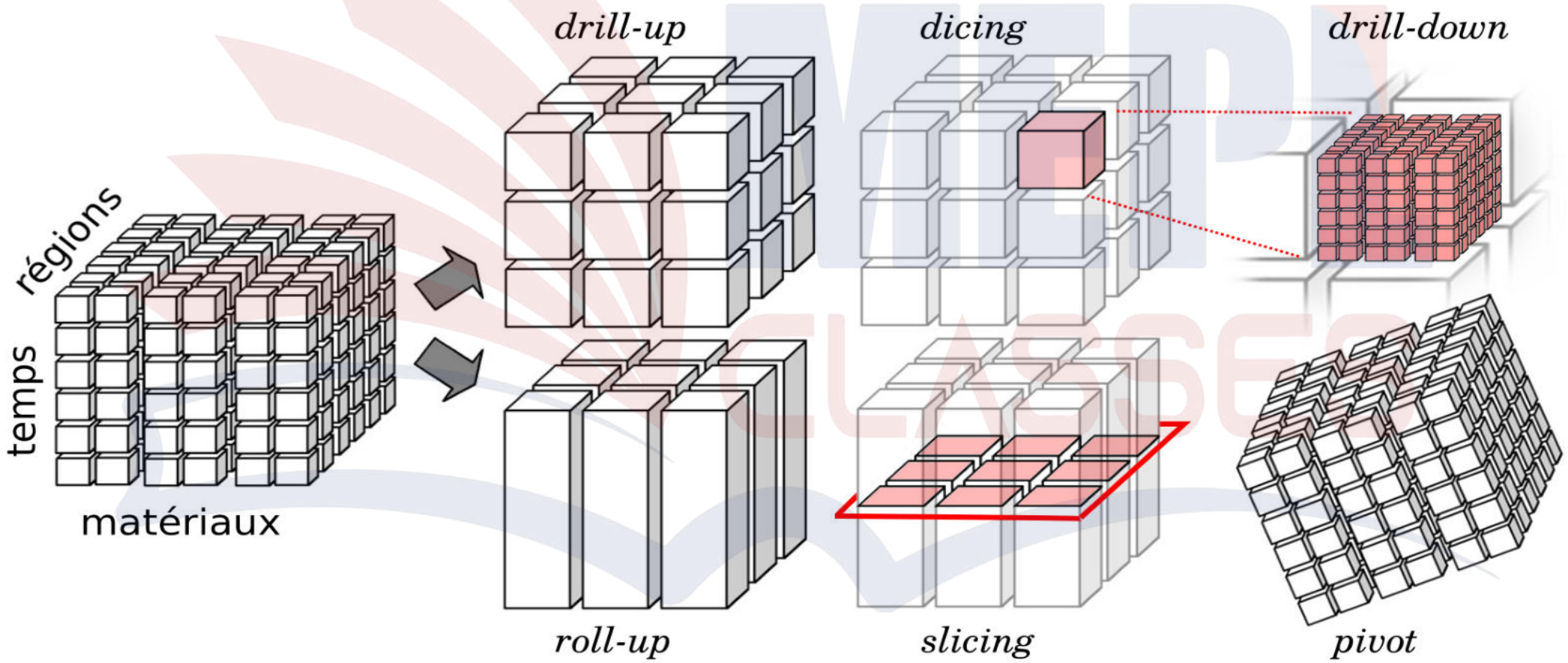
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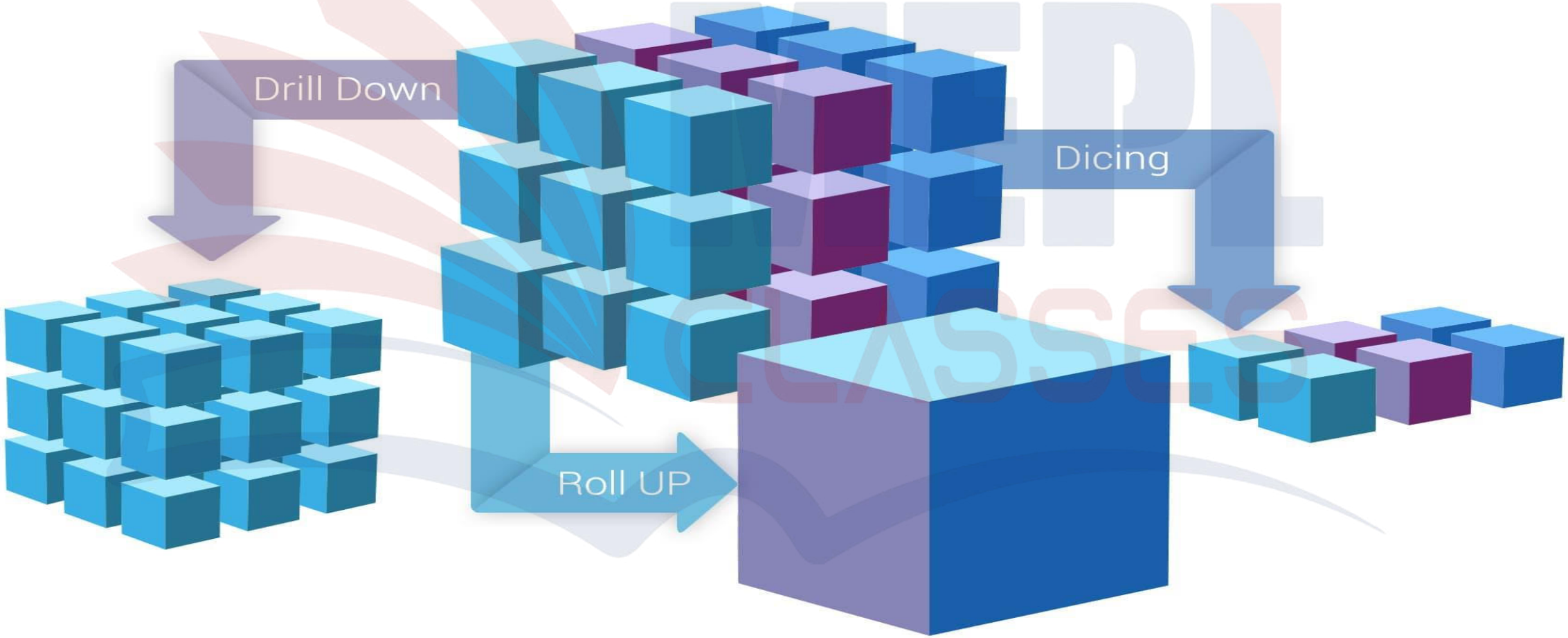




OLAP PROCESS INVOLVED



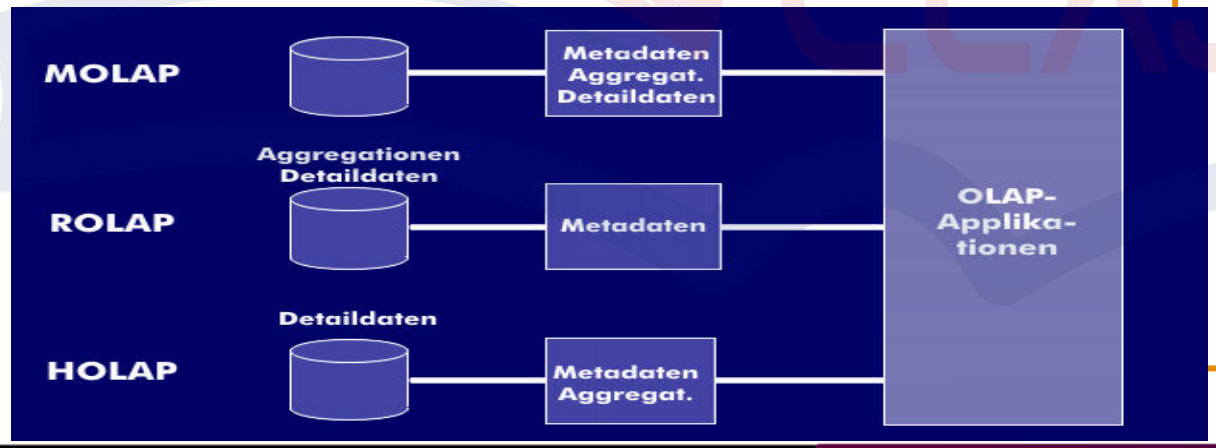
OLAP PROCESS INVOLVED





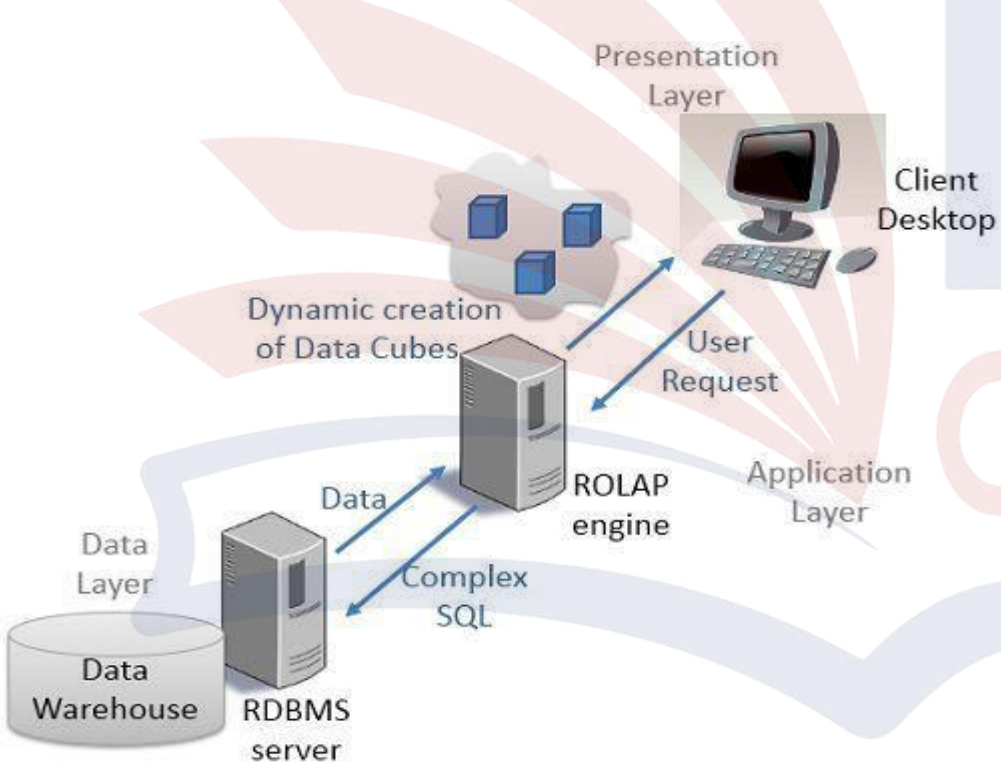
MOLAP
ROLAP
HOLAP

TYPES OF OLAP

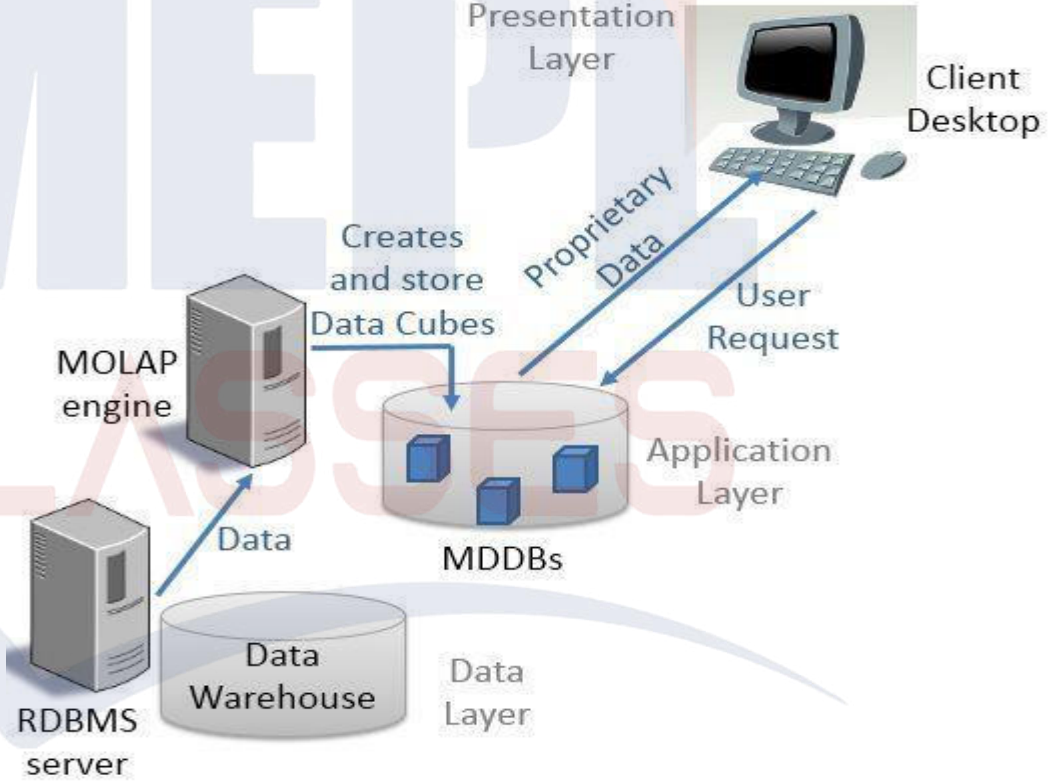


MOLAP vis a vis ROLAP vis a vis HOLAP

DIFFERENCES BETWEEN MOLAP HOLAP AND ROLAP



ROLAP Model



MOLAP Model

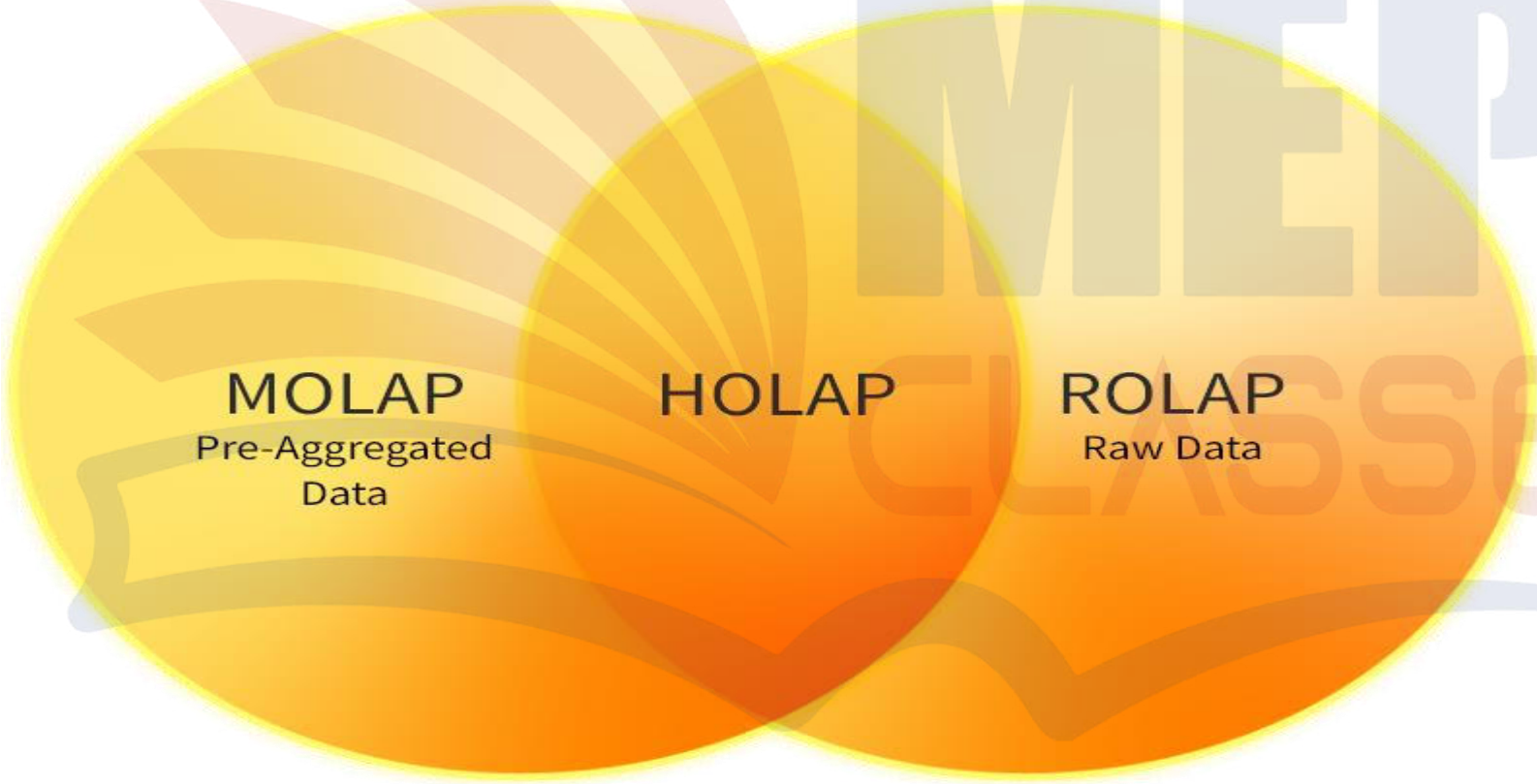
MOLAP vis a vis ROLAP vis a vis HOLAP

DIFFERENCES BETWEEN MOLAP HOLAP AND ROLAP

Basic Storage Mode	Storage Location for Detail Data	Storage Location for Summary/ Aggregations	Storage space requirement	Query Response Time	Processing Time	Latency
MOLAP	Multidimensional Format	Multidimensional Format	Medium Because detail data is stored in compressed format.	Fast	Fast	High
HOLAP	Relational Database Medium	Multidimensional Format	Small	Medium	Fast	Medium
ROLAP	Relational Database	Relational Database	Large	Slow	Slow	Low

MOLAP vis a vis ROLAP vis a vis HOLAP

DIFFERENCES BETWEEN MOLAP HOLAP AND ROLAP



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MATERIAL REQUIREMENT PLANNING (MRP)

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MATERIAL REQUIREMENT PLANNING

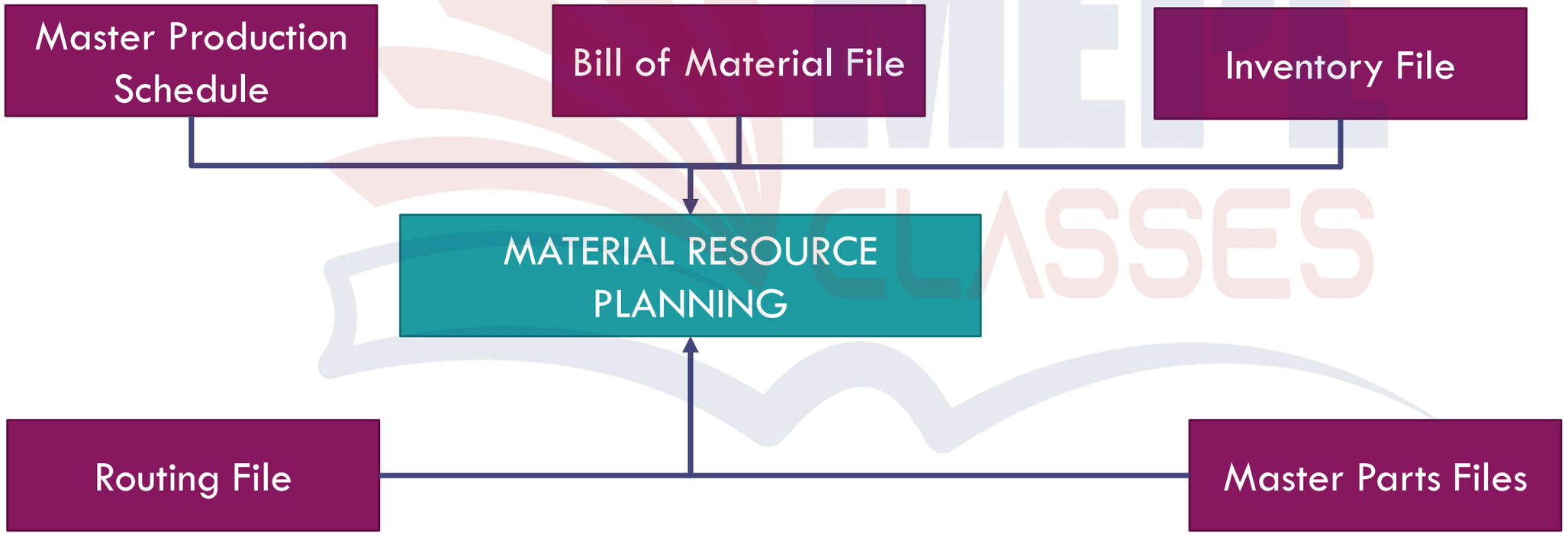
MRP OR MRP1

- MRP is a technique which aims at to ensure that material resources - raw materials bought-in components and in-house sub-assembles - are made available just before they are needed by the next stage of production or dispatch
- MRP takes care of the timely phasing of requirements, planned order releases, generation of component level requirements and rescheduling capability
- The ability of the MRP system is to deliver what is required in correct place at the correct time will be dependent on the quality of the information which is put into the computer model

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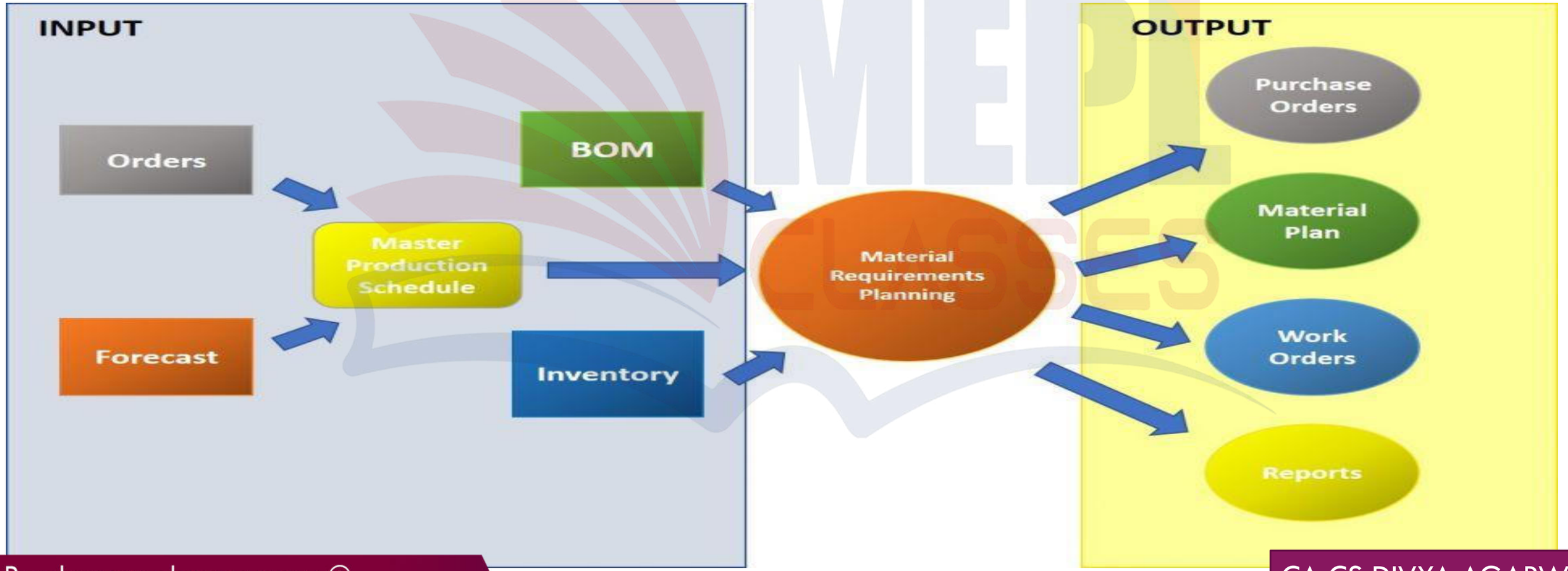
MATERIAL REQUIREMENT PLANNING

MRP OR MRP1



MATERIAL REQUIREMENT PLANNING

MRP OR MRP1



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MATERIAL REQUIREMENT PLANNING

Method of operation

- **Gross Requirements** - The demand for the components or assembly, comprising firm customer orders and forecasts

- **Scheduled Receipts** - The expected delivery dates and quantities of shop or purchase orders already put in hand.

- **Projected Available Balance** - The number of items projected to be in inventory at the end of each period (opening balance plus receipts minus issues),

- **Planned Order Release** - The order quantities required to ensure that the projected available balance does not drop below zero at any preset safety level.

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MATERIAL REQUIREMENT PLANNING

Objectives of MRP

- It determines the quality and timing of finished goods demanded.
- It determines time phased requirements of the demand for materials, components and sub-assemblies over a specified planning time horizon.
- It computes the inventories, work-in-progress batch sizes and manufacturing and packing lead times.
- It controls inventory by ordering components and materials in relation to orders received rather than ordering them from stock level point of view.

MATERIAL REQUIREMENT PLANNING

Benefits of MRP

- ❑ Significantly decreased inventory levels and corresponding decreases in inventory carrying costs.
- ❑ Fewer stock shortage, which cause production interruptions and time-consuming schedule juggling by managers.
- ❑ Increased effectiveness of production supervisors and less production chaos.
- ❑ Better customer service - an increased ability to meet delivery schedules and to set delivery dates earlier and more reliably.
- ❑ Greater responsiveness to change. MRP gives manufacturing a better feel for the effects of economic swings and changes in woodcut demand can be translated into schedule changes quickly.
- ❑ Closer coordination of the marketing, engineering, and finance activities with the manufacturing activities.

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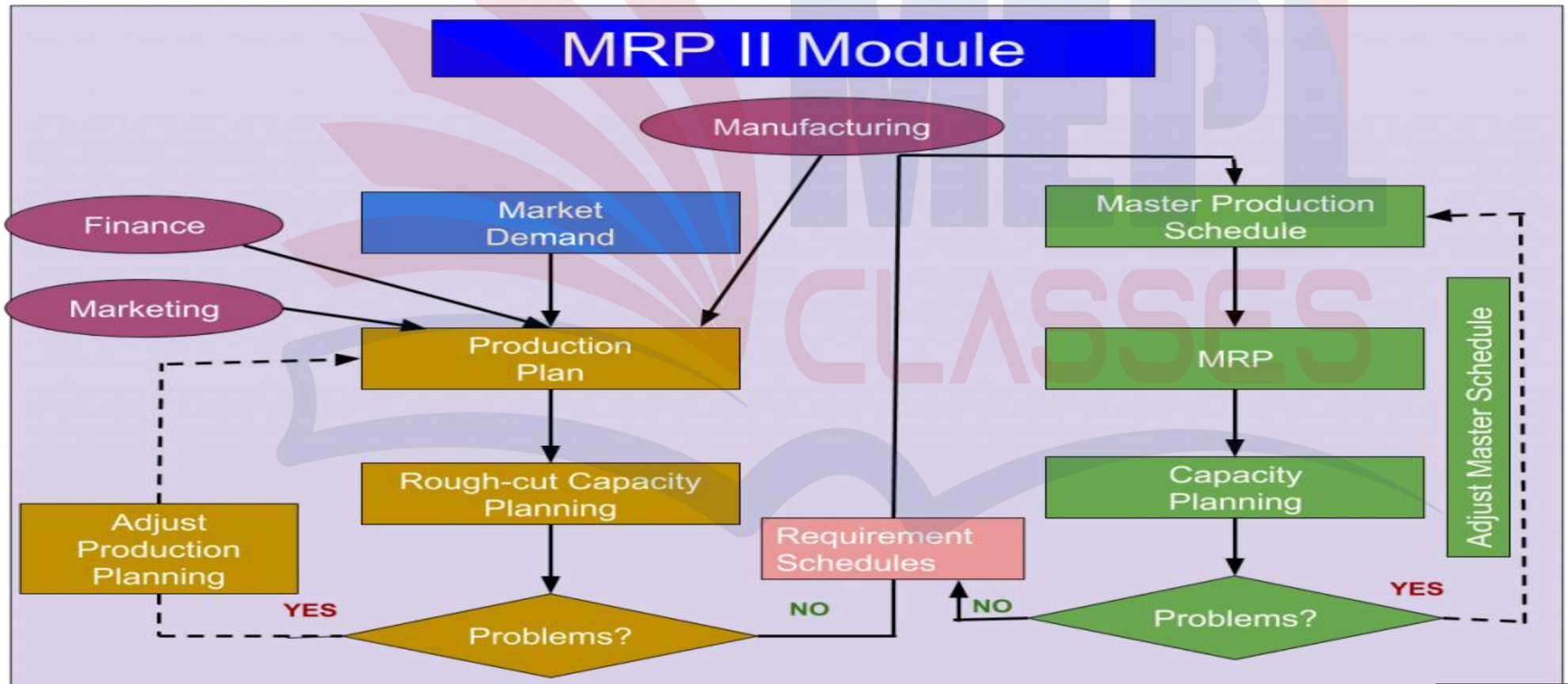
MANUFACTURING RESOURCE PLANNING (MRP II)

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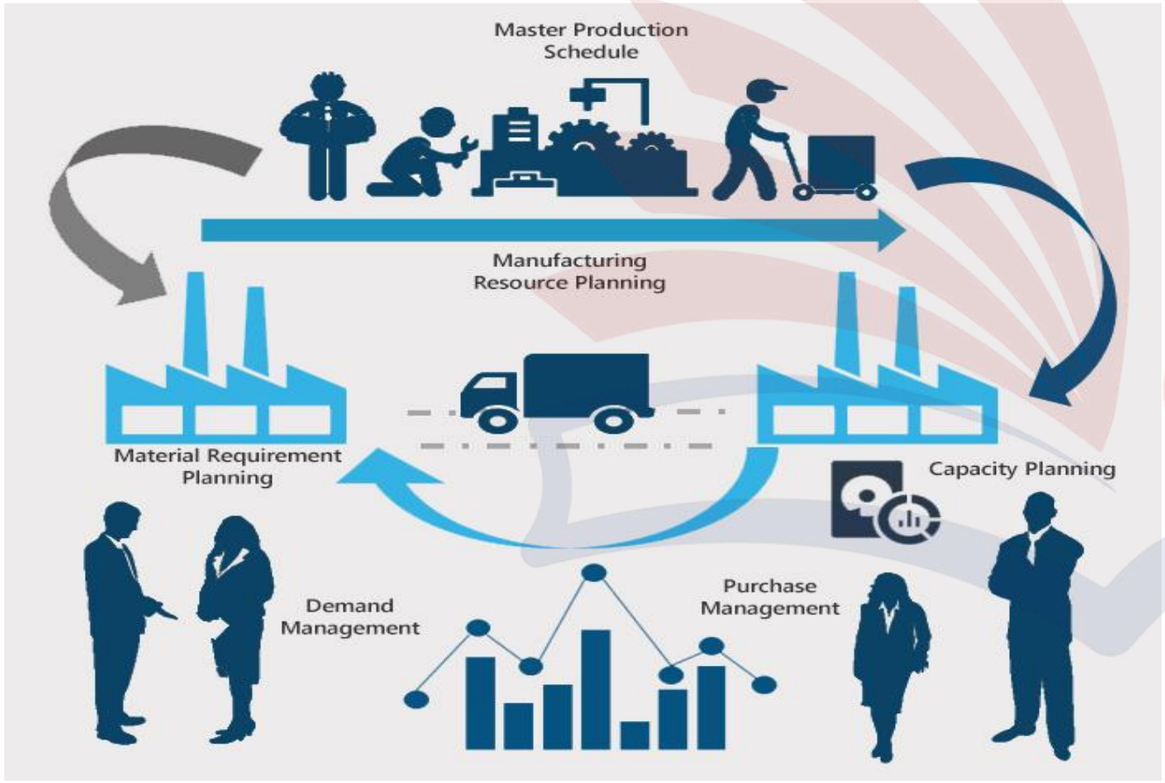
MANUFACTURING RESOURCE PLANNING

MRP II



MANUFACTURING RESOURCE PLANNING

MRP II



- MRP II utilizes software applications for coordinating manufacturing processes, from product planning, parts purchasing, inventory control to product distribution
- MRP II is made up of a variety of functions, each linked together: business planning, sales and operations planning, demand management, production planning, master scheduling, material requirement planning, capacity requirement planning, and the execution support systems for capacity and material

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MANUFACTURING RESOURCE PLANNING

MRP II

The essential elements of MRP II system are as follows:

- ❑ Demand Forecast
- ❑ Production Planning,
- ❑ Resource Planning
- ❑ Rough-cut Capacity Planning
- ❑ Master Production Schedule
- ❑ Bills of Material
- ❑ Materials Requirement Planning
- ❑ Detailed Material and Capacity Plans
- ❑ Shop and Purchase Order Release
- ❑ Purchase and Inventory Control

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ENTERPRISE RESOURCE PLANNING (ERP)

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MRP 1 vis a vis MRP 2 vis a vis ERP

MRP1 TO ERP - BASIC DIFFERENCES

MRP

Bill of Materials (BOMS)

Inventory

MRP II

Order Entry

Forecasting

Master Scheduling

AP, AR, GL

Accounting

Standard Costing

Capacity Requirement Planning

Purchasing

Master Scheduling

ERP

Supply Chain

Demand Management

Logistics and Distribution

Field Service

Marketing

Sales & Operation Planning

Advanced Costing

Quality Management

Human Resources

Product Engineering

Advancements in ERP

Customer Relationship Management (CRM)

Business Process Management (BPM)

Industry Specific Concepts

Supplier Relationship Management (SRM)

eCommerce

IoT Integration

Blockchain Integration

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TOTAL QUALITY MANAGEMENT (TQM)

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TOTAL QUALITY MANAGEMENT?

CUSTUMER ORIENTED APPROACH TO REDUCE DEFECTS



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TOTAL QUALITY MANAGEMENT?

CUSTUMER ORIENTED APPROACH TO REDUCE DEFECTS

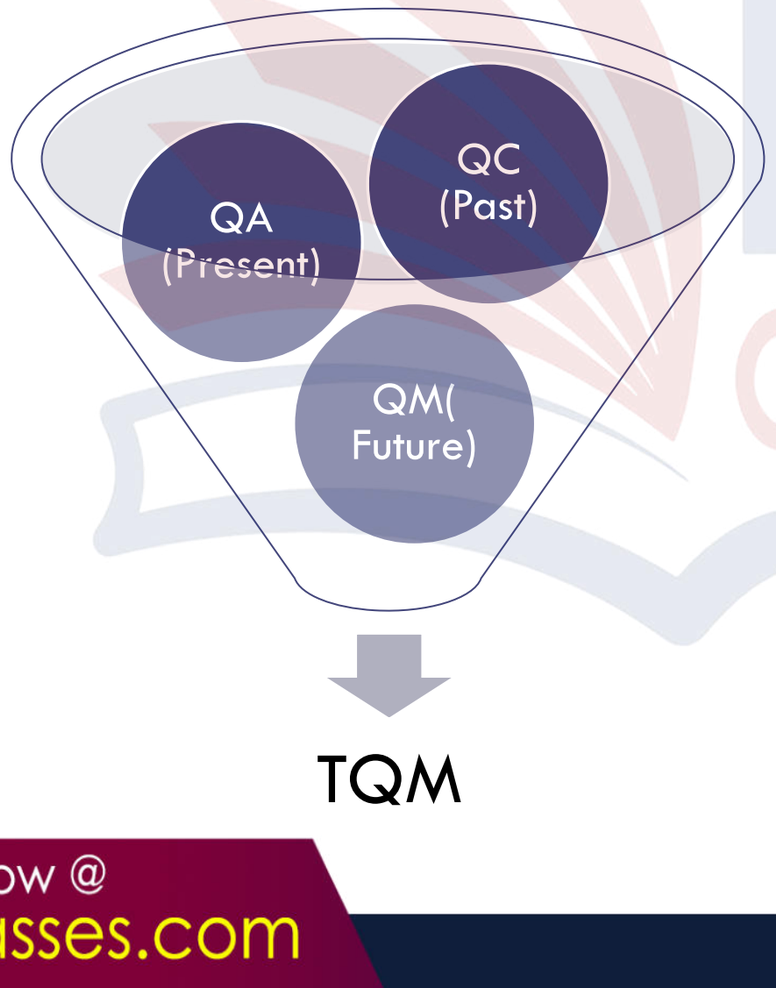
The principles of TQM are as follows:

a) Customer Focus
b) Managerial Leadership
c) Belief in continuous improvement

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TOTAL QUALITY MANAGEMENT?

CUSTUMER ORIENTED APPROACH TO REDUCE DEFECTS

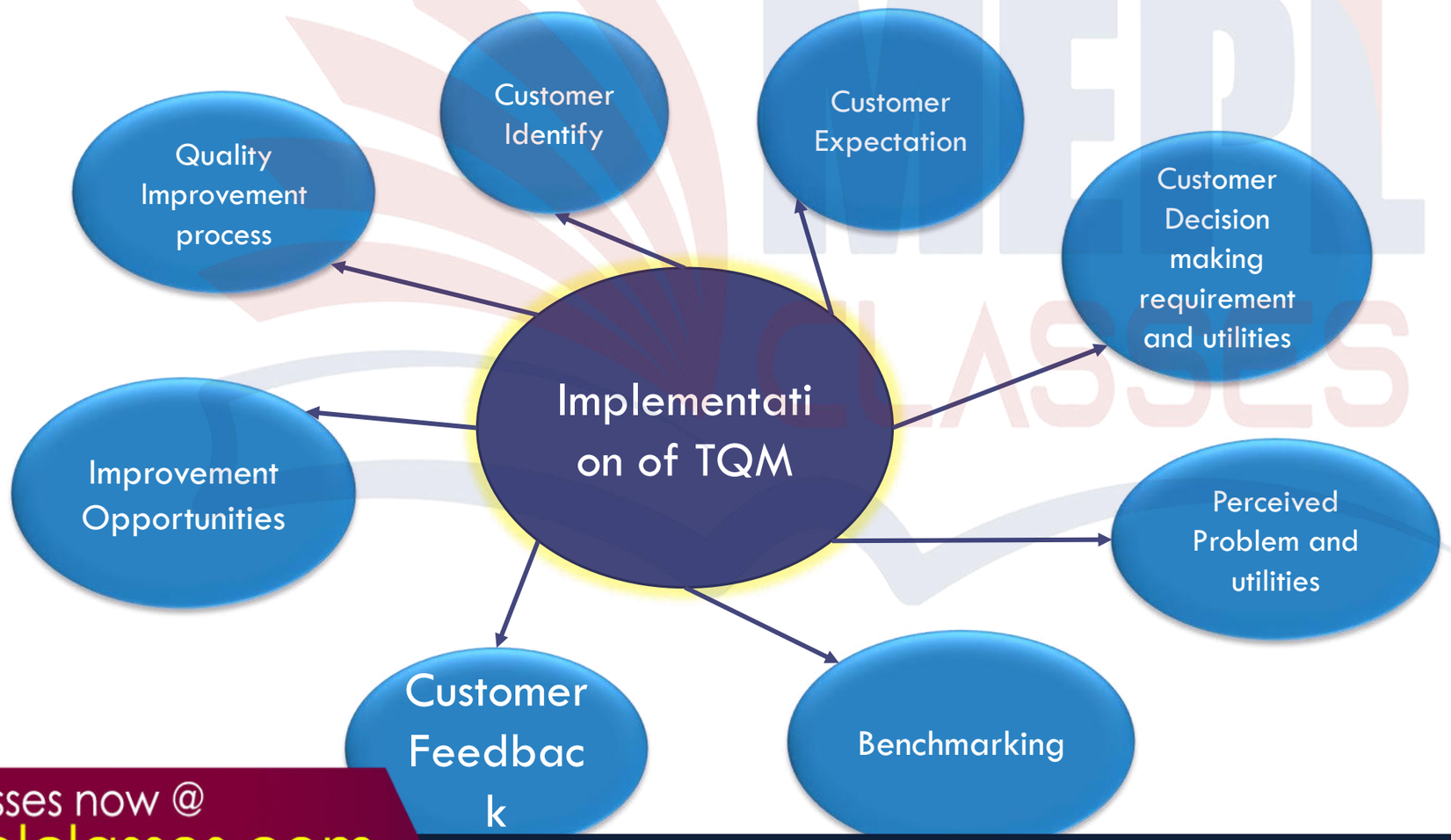


Concepts of TQM –

1) Quality Control (QC)
2) Quality Assurance (QA)
3) Quality Management (QM)

TOTAL QUALITY MANAGEMENT?

Steps to implement TQM



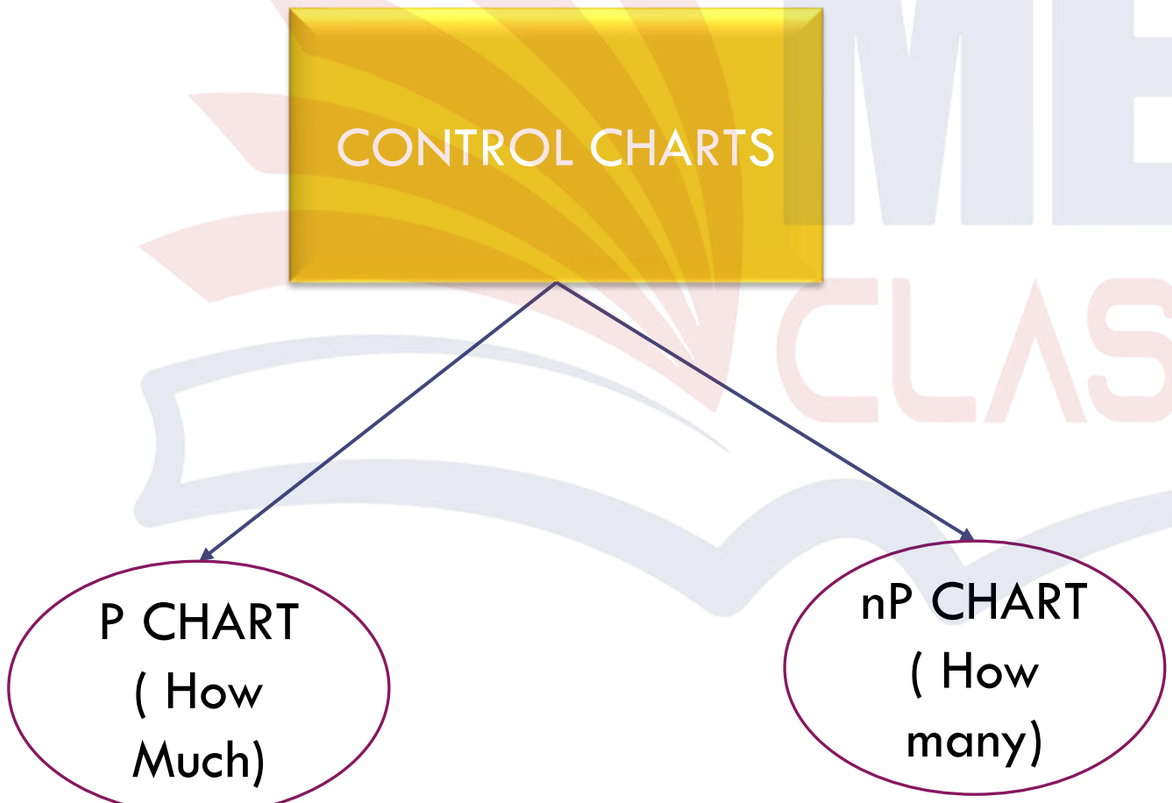
TOTAL QUALITY MANAGEMENT?

TQM implementation in MOTOROLA



TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL

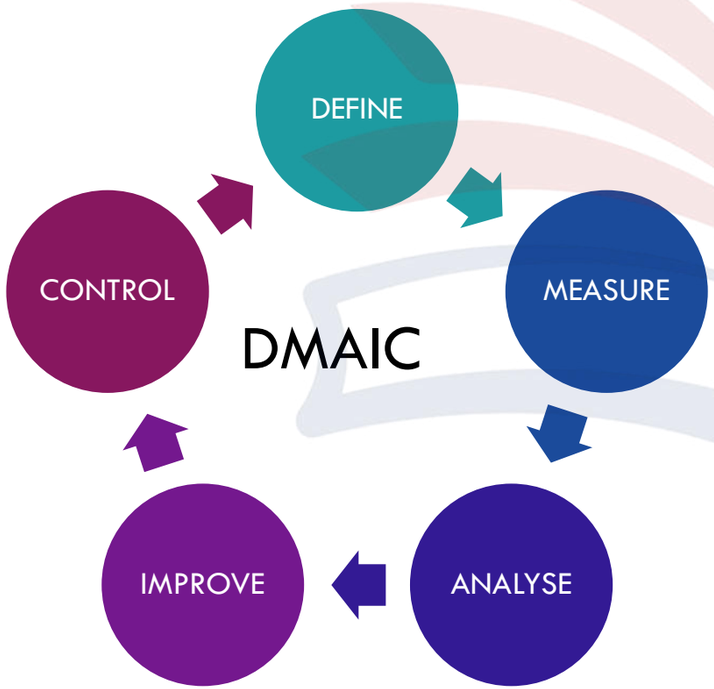


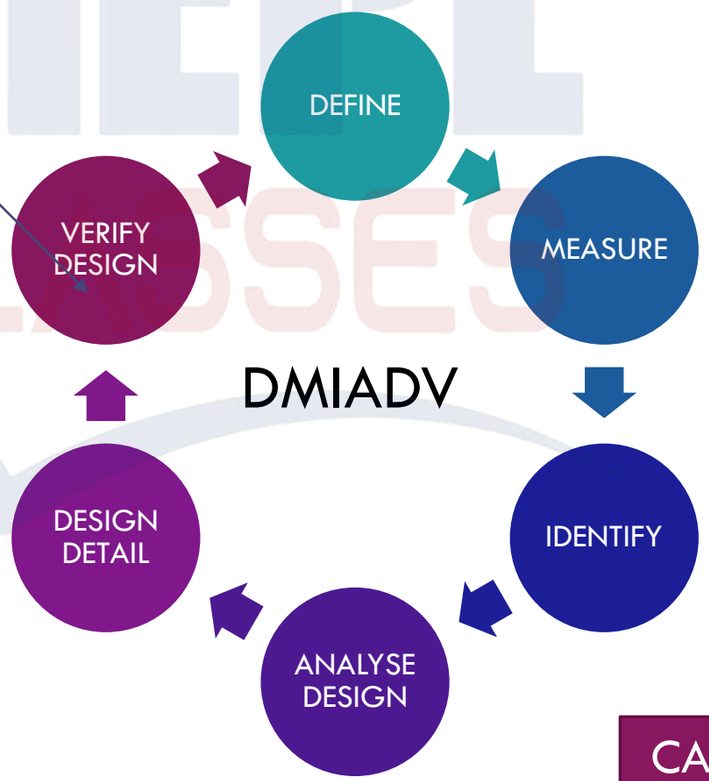
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TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL

SIX SIGMA METHODOLOGIES – W EDWARDS DEMING'S PLAN-TO-DO-CHECK-ACT CYCLE





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TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL

SIX SIGMA METHODOLOGIES – KEY ROLES

CEO/ EXECUTIVE LEADER → CHAMPIONS/ QUALITY LEADERS → MASTER BLACK BELTS







TOTAL QUALITY MANAGEMENT?

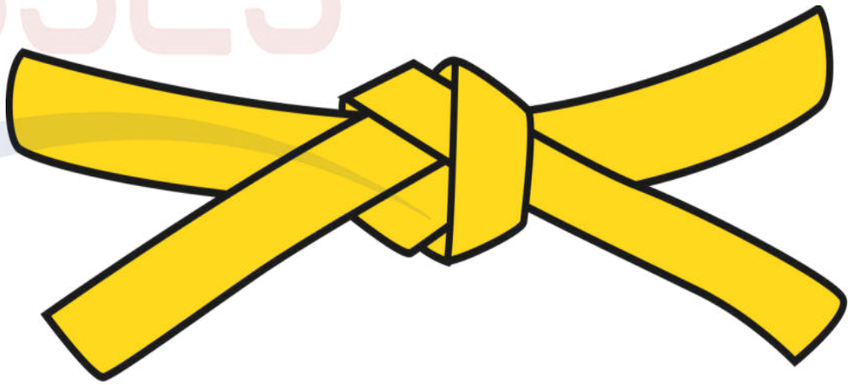
METHODS OF QUALITY CONTROL

SIX SIGMA METHODOLOGIES – KEY ROLES

MASTER BLACK BELTS







TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL

SIX SIGMA METHODOLOGIES – QUALITY CONTROL PROCESS

a) Continuous efforts to reduce variation in process outputs is key to business success
b) Manufacturing and business processes can be measured, analyzed, improved and controlled
c) Succeeding at achieving sustained quality improvement requires commitment from the entire organization, particularly from top-level management.

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TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL

SIX SIGMA METHODOLOGIES – MUMBAI DABBAWALA



TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL

Total Quality Management's Concept in Quality Management



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TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL



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TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL



TOTAL QUALITY MANAGEMENT?

QUALITY COST

MANUFACTURE QUALITY COST (INTERNAL QUALITY COST)



USER QUALITY COST (EXTERNAL QUALITY COST)

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SPM CMA FINAL
CHAPTER 2-PRACTICAL PARTS

Illustration 1:

A company manufactures a single product, which requires two components. The company purchases one f the components from two suppliers: X Limited and Y Limited. The price quoted by X Limited is `180 per hundred units of the component and it is found that on an average 3 per cent of the total receipt from this supplier is defective. The corresponding quotation from Y Limited is `174 per hundred units, but the defective would go up to 5 per cent. If the defectives are not detected, they are utilized in production causing a damage of `180 per 100 units of the component.

The company intends to introduce a system of inspection for the components on receipt. The inspection cost is estimated at `24 per 100 units of the component. Such as inspection will be able to detect only 90 per cent of the defective components received. No payment will be made for components found to be defective in inspection.

Required:

(i) Advise whether inspection at the point of receipt is justified ?

(ii) Which of the two suppliers should be asked to supply? (Assume total requirement is 10,000 units of the component.)

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Illustration 2:

TQ Ltd. implemented a quality improvement program and had the following results: (` '000)

Particulars	2011	2012
Sales	6,000	6,000
Scrap	600	300
Rework	500	400
Production inspection	200	240
Product warranty	300	150
Quality trainin	75	150
Materials inspection	80	60

You are required to:

(i) Classify the quality costs as prevention, appraisal, internal failure and external failure and express each class as a percentage of sales.

(ii) Compute the amount of increase in profits due to quality improvement.

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Illustration 3:

Carlon Ltd. makes and sells a single product, the unit specifications are as follows:

Direct material X	8 sq. meter at `40 per square meter
Machine time	0.6 Running hours
Machine cost per gross hour	` 400
Selling price	`1,000

Carlon Ltd. requires to fulfill orders for 5,000 product units per period. There is no stock of product units at the beginning or end of the period under review. The stock level of material X remains unchanged throughout the period.

Carlon Ltd. is planning to implement a Quality Management Program (QMP). The following additional information regarding costs and revenues are given as of now and after implementation of quality management program.

	Before the implementation of QMP		After the implementation
1	5% of incoming material from suppliers scrapped due to poor receipt and storage organization.	1	Reduced to 3%
2	4% of Material X input to the machine process is wasted due to processing problems.	2	Reduced to 2.5%
3	Inspection and storage of Material X costs `1 per square meter purchased,	3	No change in the unit rate
4	Inspection during the production cycle, calibration checks on inspection equipment vendor rating and other checks cost `2,50,000 per period.	4	Reduction of 40% of the existing cost
5	Production quantity is increased to allow for the down grading of 12.5% of the production units at the final inspection stage. Down graded units are sold as seconds at a discount of 30% of the standard selling price	5	Reduction to 7.5%
6	Production quantity is increased to allow for return from customers (these are replaced free of charge) due to specification failure and account for 5% of units actually delivered to customer.	6	Reduction to 2.5%
7	Product liability and other claims by customers is estimated at 3% of sales revenue from standard product sale.	7	Reduction to 1%
8	Machine idle time is 20% of gross machine hours used (i.e. running hour = 80% of gross/hrs.).	8	Reduction to 12.5%
9	Sundry costs of administration, selling and distribution total – `6,00,000 per period.	9	Reduction by 10% of the existing
10	Prevention program costs `2,00,000.	10	Increase to `6,00,000

The total quality management program will have a reduction in machine run time required per product unit to 0.5 hr.

Required:

(a) Prepare summaries showing the calculation of (i) Total production units (pre-inspection), (ii) Purchase of materials X (square meters), (iii) Gross machine hours.

In each case, the figures are required for the situation both before and after the implementation of the quality management program so that orders for 5,000 product units can be fulfilled.

(b) Prepare Profit and Loss account for Carlon Ltd. for the period showing the profit earned both before and after the implementation of the total quality program.

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Solution:

(a)

Particulars	Before implementation of QMP	After implementation of QMP
(i) Calculation of Total production (pre-inspection)	(Units)	(Units)
Sales required to fulfill orders	5,000	5,000
Add: Specification losses (@ 5%); (@ 2.5%)	250	125
	5,250	5,125
Add: Down grading at inspection $\left(\left\|5,250 \times \frac{12.5}{87.5}\right\|\right); \left(\left\|5,125 \times \frac{7.5}{92.5}\right\|\right)$	750	416
Total production before inspection	6,000	5,541
(ii) Calculation of purchase of Material 'X'	(Sq. Meters)	(Sq. Meters)
Material required (6,000 units × 8); (5,541 units × 8)	48,000	44,328
Add: Processing loss $\left(\left\|48,000 \times \frac{4}{96}\right\|\right); \left(\left\|44,328 \times \frac{2.5}{97.5}\right\|\right)$	2,000	1,137
	50,000	45,465
Add: Scrapped material (50,000 × 5/95); (45,465 × 3/97)	2,632	1,406
Total material required to purchase	52,632	46,871
(iii) Calculation of Gross Machine Hours	(Machine Hrs.)	(Machine Hrs.)
Machine hrs. required for total production (6,000 × 0.6); (5,541 × 0.5)	3,600	2,771
Add: Idle Time (3,600 × 20/80); (2,771 × 12.5/87.5)	900	396
Total gross machine hours required	4,500	3,167

(b) Profit and Loss Account showing profit earned before and the implementation of QMP (`)

Particulars	Before implementation of QMP		After implementation of QMP	
Sales	(5,000 units × `1,000)	50,00,000	(5,000 units × `1,000)	50,00,000
Sales downgraded	(750 units × `700)	5,25,000	(416 units × `700)	2,91,200
	(a)	55,25,000		52,91,200
Costs:				
Materials	(52,632 S. M. × `40)	21,05,280	(46,871 S. M. × `40)	18,74,840
Inspection & storage	(52,632 S. M. × `1)	52,632	(46,871 S. M. × `1)	46,871
Machine Cost	(4,500 hrs. × `400)	18,00,000	(3,167 hrs. × `400)	12,66,800
Inspection & other cost	(Actual)	2,50,000	(`2,50,000 × 60/100)	1,50,000
Product Liability	(`50,00,000 × 3/100)	1,50,000	(`50,00,000 × 1/100)	50,000
S&D and Admn. Costs	(Actual)	6,00,000	(`6,00,000 × 90/100)	5,40,000
Preventive program cost		2,00,000		6,00,000
	(b)	51,57,912		45,28,511
Net profit	(a) – (b)	3,67,088		7,62,689

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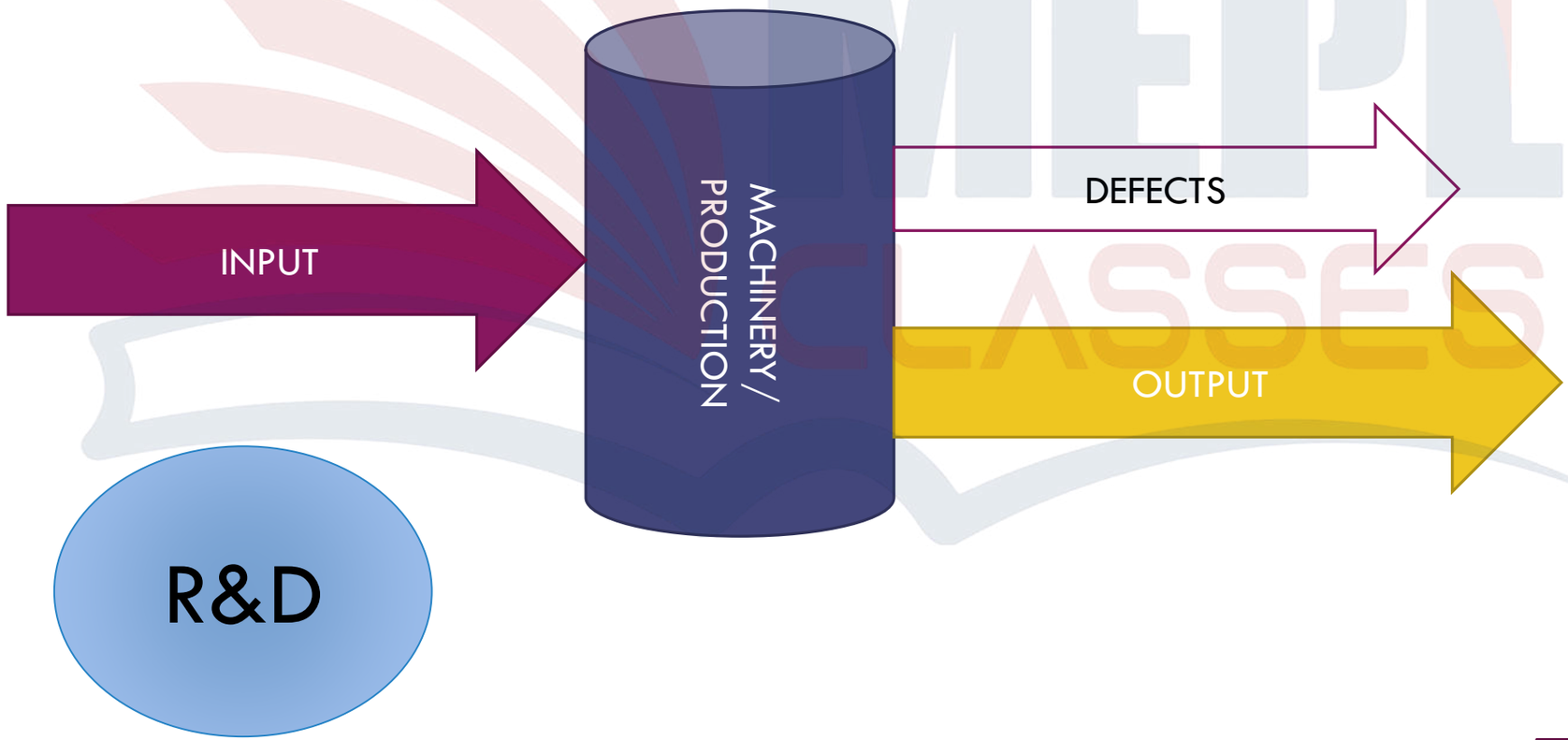
TOTAL QUALITY MANAGEMENT (TQM)

SPM CHAPTER 3

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TOTAL QUALITY MANAGEMENT?

CUSTUMER ORIENTED APPROACH TO REDUCE DEFECTS



TOTAL QUALITY MANAGEMENT?

CUSTUMER ORIENTED APPROACH TO REDUCE DEFECTS

The principles of TQM are as follows:

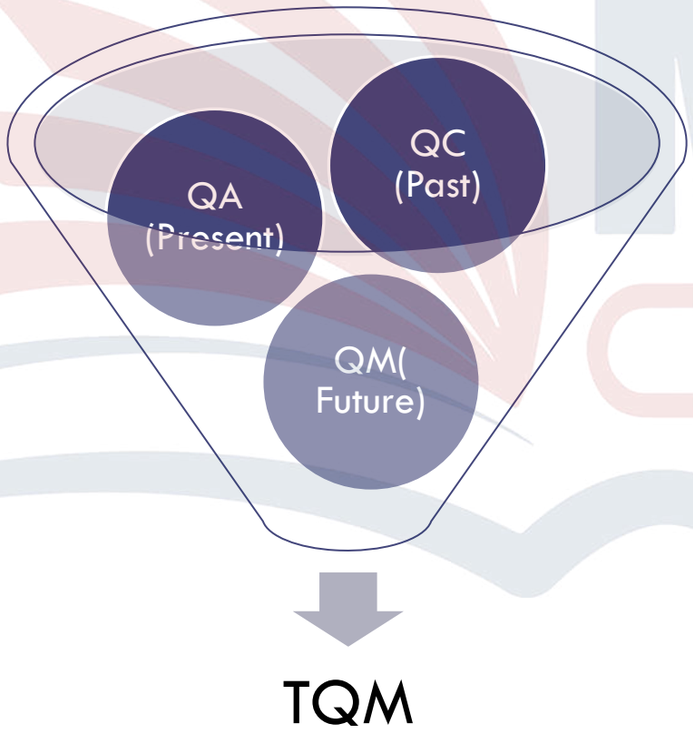
a) Customer Focus

b) Managerial Leadership

c) Belief in continuous improvement

TOTAL QUALITY MANAGEMENT?

CUSTUMER ORIENTED APPROACH TO REDUCE DEFECTS

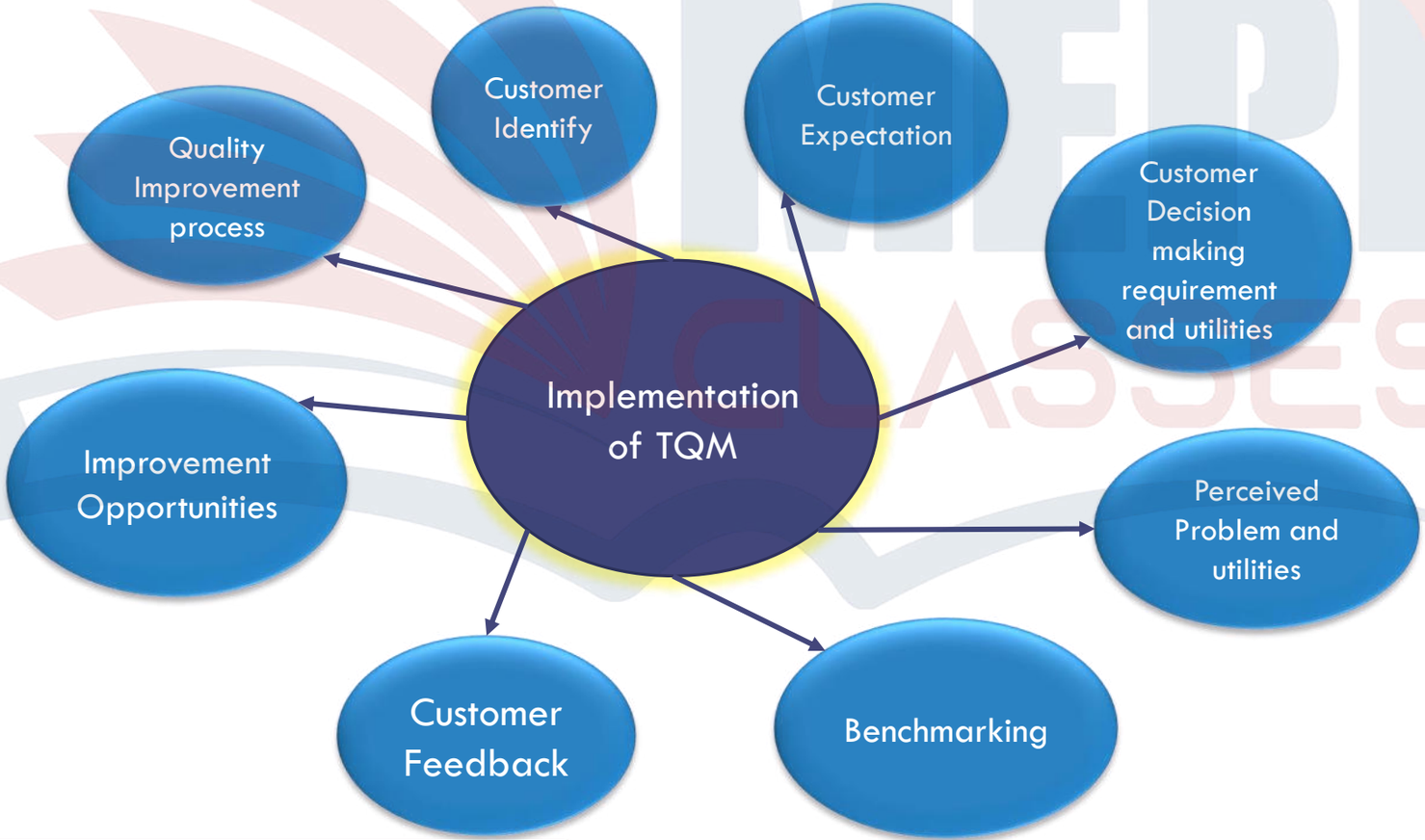


Concepts of TQM –

1) Quality Control (QC)
2) Quality Assurance (QA)
3) Quality Management (QM)

TOTAL QUALITY MANAGEMENT?

Steps to implement TQM



TOTAL QUALITY MANAGEMENT?

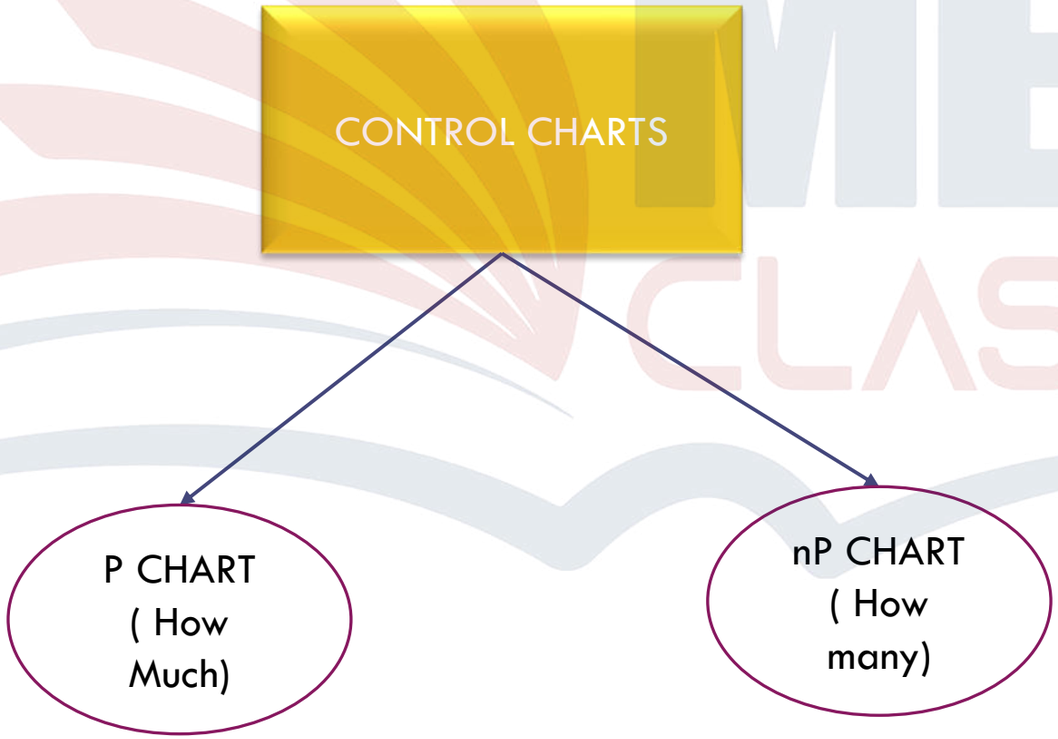
TQM implementation in MOTOROLA



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TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL

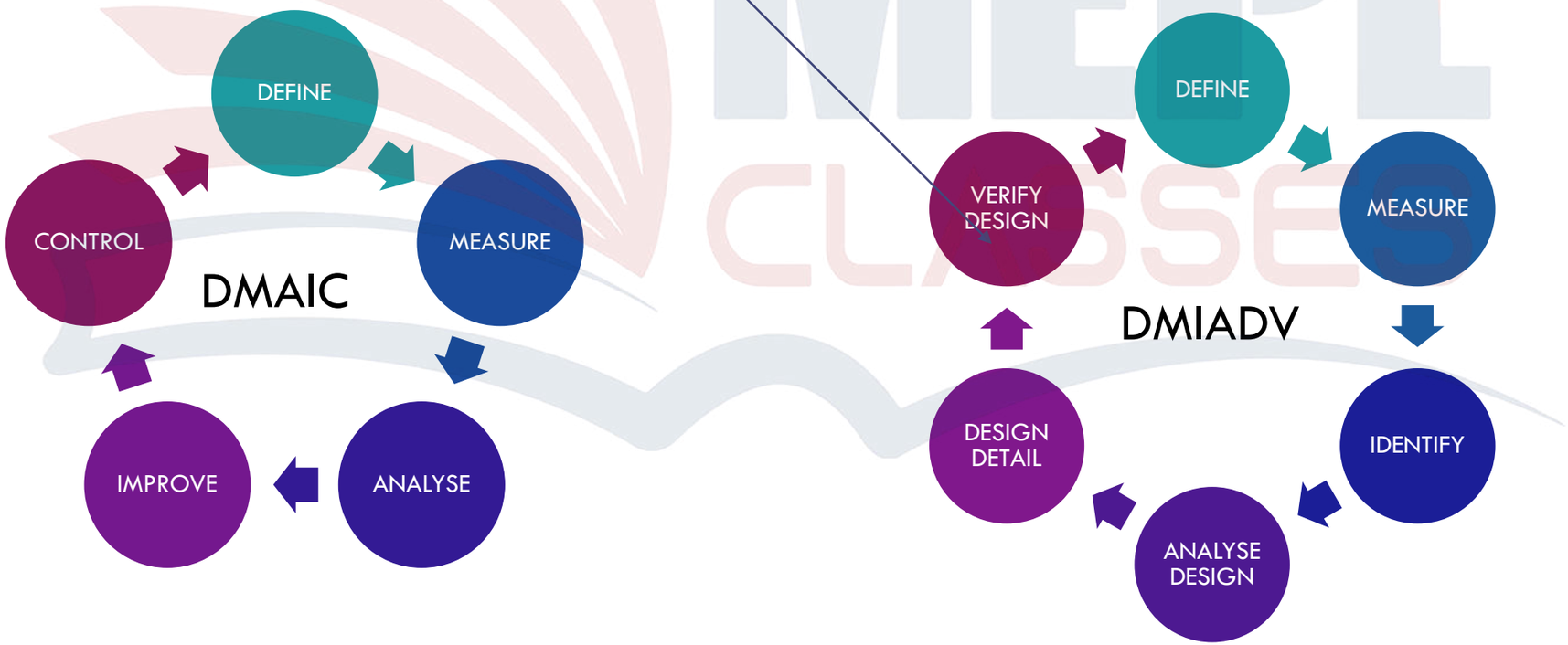


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TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL

SIX SIGMA METHODOLOGIES – W EDWARDS DEMING'S PLAN-TO-DO-CHECK-ACT CYCLE



TOTAL QUALITY MANAGEMENT?

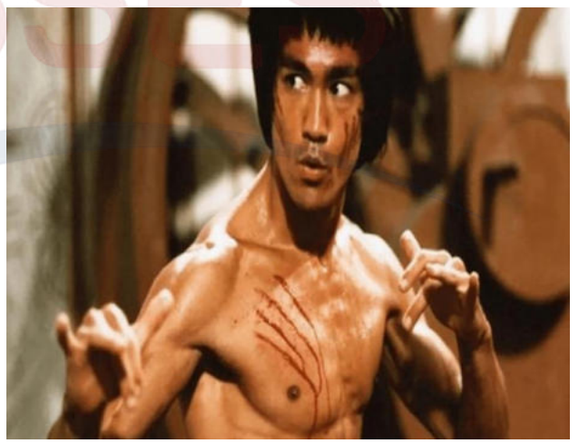
METHODS OF QUALITY CONTROL

SIX SIGMA METHODOLOGIES – KEY ROLES

CEO/ EXECUTIVE LEADER → CHAMPIONS/ QUALITY LEADERS → MASTER BLACK BELTS







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TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL

SIX SIGMA METHODOLOGIES – KEY ROLES

MASTER BLACK BELTS



TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL

SIX SIGMA METHODOLOGIES – QUALITY CONTROL PROCESS

a) Continuous efforts to reduce variation in process outputs is key to business success
b) Manufacturing and business processes can be measured, analyzed, improved and controlled
c) Succeeding at achieving sustained quality improvement requires commitment from the entire organization, particularly from top-level management.

3.4 defects per (one) million opportunities (DPMO)

TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL

SIX SIGMA METHODOLOGIES – MUMBAI DABBAWALA



TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL

5 S's Concept in Quality Management



TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL



TOTAL QUALITY MANAGEMENT?

METHODS OF QUALITY CONTROL



TOTAL QUALITY MANAGEMENT?

QUALITY COST

MANUFACTURE QUALITY COST (INTERNAL QUALITY COST)



USER QUALITY COST (EXTERNAL QUALITY COST)

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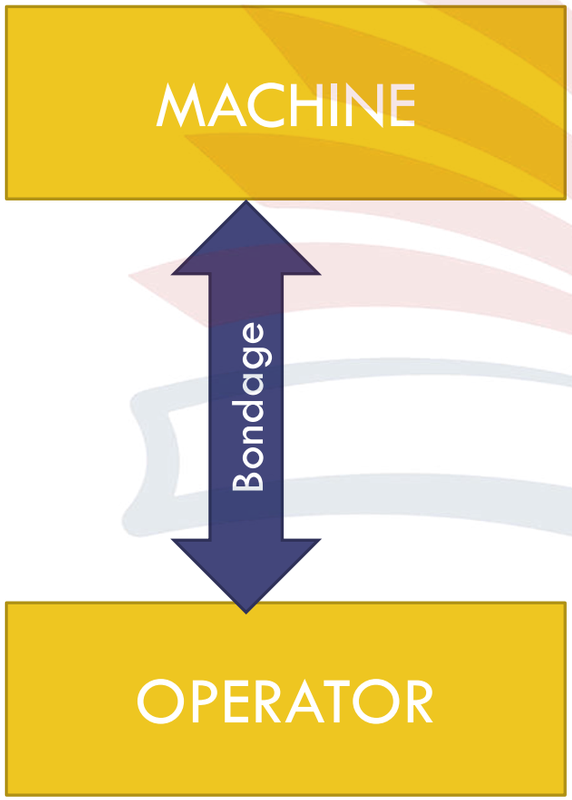
TOTAL PRODUCTIVITY MANAGEMENT(TPM)

SPM CHAPTER 3

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TOTAL PRODUCTIVITY MANAGEMENT?

TPM IS AN EXTENTION OF TQM



1) Machine availability, efficiency and reliability.
2) Reduces wastes of different forms like idleness due to breakdown, stock-out of some of regular spares, additional manpower otherwise required for storing some of the regular spares and for regular machine inspection & general maintenance.
3) Thus, TPM favors 'lean' manufacturing.

TOTAL PRODUCTIVITY MANAGEMENT?

Originated in JAPAN in 1971

1) "deterioration prevention": deterioration is what happens naturally to anything that is not "taken care of". For this reason many people refer to TPM as "total productive manufacturing" or "total process management".
2) TPM is a proactive approach that essentially aims to identify issues as soon as possible and plan to prevent any issues before occurrence.
3) One motto is "zero error, zero work-related accident, and zero loss

TOTAL PRODUCTIVITY MANAGEMENT?

Originated in JAPAN in 1971

"Continuously improve all operational conditions, within a production system; by stimulating the daily awareness of all employees" (by Seiichi Nakajima, Japan, JIPM)

TOTAL PRODUCTIVITY MANAGEMENT - OBJECTIVES

Objective of TPM

An accurate and practical implementation of TPM, will increase productivity within the total organization, where:

(i) a clear business culture is designed to continuously improve the efficiency of the total production system

(ii) a standardized and systematic approach is used, where all losses are prevented and/or known.

(iii) all departments, influencing productivity, will be involved to move from a reactive to a predictive mindset.

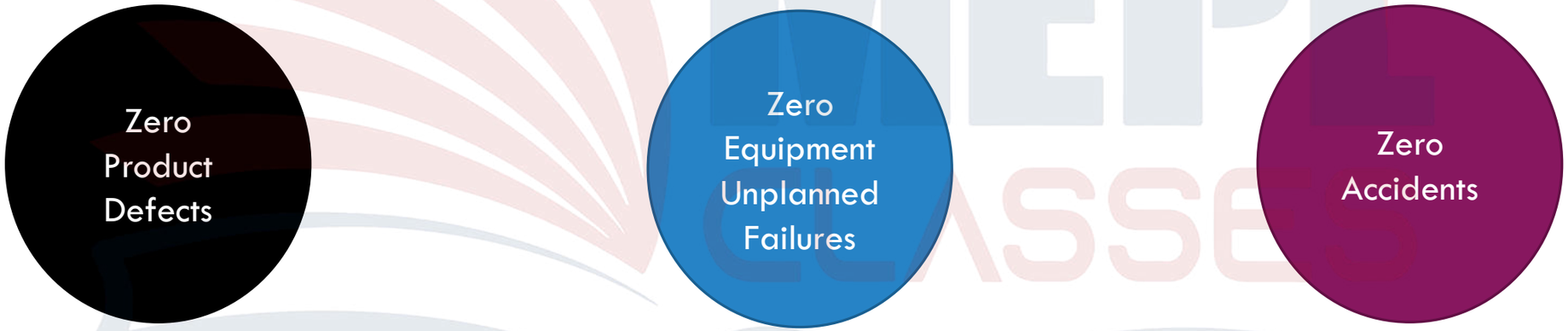
(iv) a transparent multidisciplinary organization in reaching zero losses.

(v) steps are taken as a journey, not as a quick menu

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TOTAL PRODUCTIVITY MANAGEMENT - GOALS

GOALS of TPM



TOTAL PRODUCTIVITY MANAGEMENT

Limitation in implementations

- First is having insufficient knowledge and skills especially in understanding the linkages between the 8 Pillar-Activities in TPM.
- TPM requires more time, resources and efforts than most of these companies believe they can afford. A typical TPM implementation requires company-wide participation and full results can only be seen after 3 years and sometimes 5 years

TOTAL PRODUCTIVITY MANAGEMENT

Steps to Implement – 8 pillar activity of TPM

1. Identify the key people
2. Management should learn the philosophy.
3. Management must promote the philosophy.
4. Training for all the employees.
5. Identify the areas where improvement are needed.
6. Make an implementation plan.
7. Form an autonomous group
8. Continuous process

TOTAL PRODUCTIVITY MANAGEMENT

Benefits of TPM

- Development of new management goals
- Team bonding & accountability improvement
- Improved quality and total cost competitiveness
- Productivity and quality team training for problem solving
- Earlier detection of factors critical to maintaining equipment "uptime"
- Measure impact of defects, sub-optimal performance, and downtime using OEE (Overall Equipment Effectiveness)
- Motivated people function better all the time

CHAPTER 3

DEMAND

SPM

CMA FINAL

UNIT-1

MEANING OF DEMAND

Demand refers to the quantity of a particular commodity which a consumer ready, willing and able to purchase at a particular price and at a particular period of time.

The quantity demanded of any commodity is the amount of that commodity, that buyers are willing and able to purchase at a given price.

Demand = Desire + Purchasing Power

THREE ELEMENTS OF DEMAND

- **Quantity**
- **Price**
- **Speci·c time and place**

DEMAND FUNCTION

Functional relationship between demand and various factors is termed as demand function.

$$Dx = f(P, Pr, I, T, Fe)$$

DETERMINANTS OF DEMAND

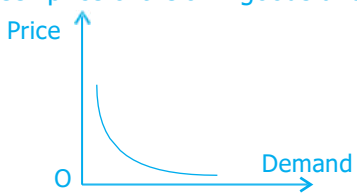
- **Price**
- **Income**
- **Expectations about future**
- **Number of Buyers**
- **Tastes**
- **Prices of other goods**
- **Quality**

FACTORS AFFECTING DEMAND

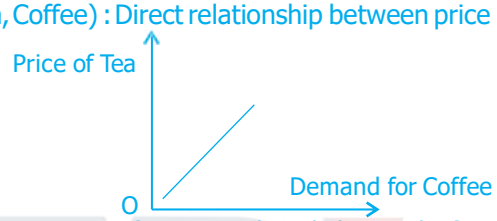
All the factors are discussed below one by one :

1. Price of the own commodity (Inverse) : There exists an inverse relationship between price of the own goods and its demand(ceteris, paribus Ie. other factors being constant).

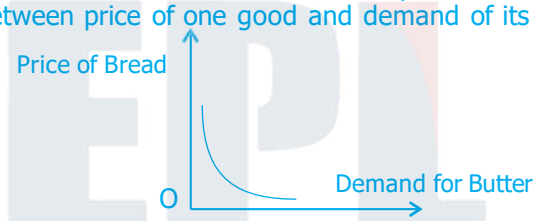
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2. Price of the related goods : (a) Competing Goods / Substitute Goods (Tea, Coffee) : Direct relationship between price of one good and demand for its substitutes(ceteris, paribus).



(b) Complementary Goods (Bread, Butter) : Inverse relationship between price of one good and demand of its complementary(ceteris, paribus).



3. Income of consumer : (a) Normal Goods (Wheat, Rice) : Direct relationship (upward slopping).
   (b) Inferior Goods (Bajra, Ragi) : Inverse relationship (backward bending).
4. Taste and Preference : Moves in favor, demand rises; moves against, demand falls.
5. Future expected price of the commodity : (Fe rises, D rises) (Fe falls, D falls) (direct relationship)

TYPES OF DEMAND

Individual Demand :

- Individual demand refers to quantity demanded of a commodity at a given price, by an individual consumer.

Market Demand :

- Market demand is the aggregation of individual demand.

MARKET DEMAND

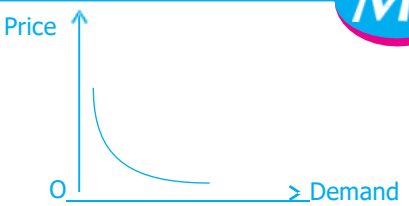
1. **Demographic structure of the country (Nature and Size of population).**
2. **Distinction of Income : (a) Equal (Basic necessary goods) (b) Unequal (luxury goods)**
3. **Government Policy : (a) Taxes (demand falls) (b) Subsidy (demand rises)**
4. **Business Cycle : (a) Boom (demand rises) (b) Depression (demand falls)**
5. **Seasonal and Weather conditions**

LAW OF DEMAND

"Other things being equal, the quantity demanded increases with a fall in price and diminishes when price rises".

The claim that the quantity demanded of goods falls when the price of the goods rises & vice versa can be explained in the following demand schedule.

THEORY OF DEMAND



1. Inverse relationship between price and demand (ceteris, paribus).
2. Is a qualitative statement (states that direction and non magnitude).
3. States that effect of change of price on demand and not vice - versa.

EXCEPTIONS TO THE LAW OF DEMAND

1. **Giffen Goods (upward slopping) : There is a positive relationship between the price of a good and its quantity demanded.**
2. **Veblen (ostentatious) Goods (upward slopping) : There is a positive relationship between the price of a good and its quantity demanded.**
3. **Speculation (share market)**
4. **Band wagon Effect (Playing Golf)**
5. **Habits (Drugs, Alcohol)**
6. **Further changes in future expected price of the commodity.**

DEMAND SCHEDULE

Tabular representation of the relation between demand and price is demand schedule.

PRICE (RS./KG)	Demand for mangoes (Kg / week)
30	5
25	10
20	15
15	20
10	25

The table that shows the relationship between the price of a commodity and the quantity demanded

Example :

Individual Demand for mangoes.

DEMAND CURVE

Graphical representation of the relation between demand and price is demand curve.

Movement Along the same Demand curve.

Also Known as Contraction
or Expansion In Demand .

CHANGE IN QUANTITY DEMANDED / MOVEMENT ALONG THE DEMAND CURVE

Change in quantity demanded / movement along the demand curve takes place because of change in price (ceteris, paribus).

(a) Expansion (price falls, demand rises) : Downward movement along the same demand curve.

(b) Contraction (price rises, demand falls) : Upward movement along the same demand curve. Diagram no. 7

CHANGE IN DEMAND / SHIFT IN THE DEMAND CURVE

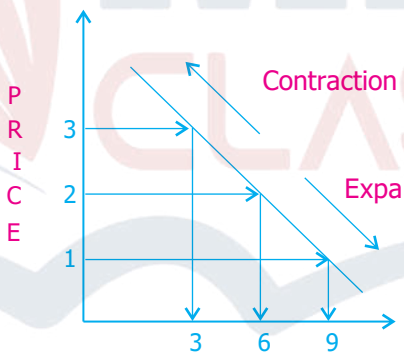
Change in demand / shift in the demand curve takes place because of other factors, price remaining constant.

(a) Increase in demand : Rightward shift (Ps rises or Pc falls or Irises or T greater than or Fe rises).

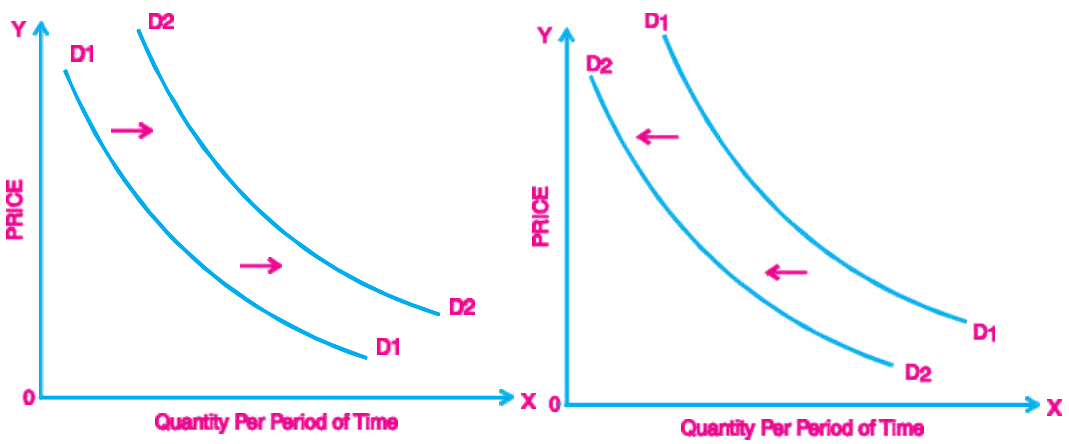
(b) Decrease in demand : Leftward shift (Ps falls or Pc rises or Ifalls or T less than or Fe falls). Diagram no. 8

VARIABLES THAT INFLUENCES BUYERS AND THEIR EFFECT ON DEMAND CURVE.

- Price causes a movement along the D curve
- No. of buyers shifts the D curve
- Income shifts the D curve
- Price of related goods shifts the D curve
- Tastes shifts the D curve
- Expectations shifts the D curve



D. No. 7



D. No. 8

Q. 1 In a typical Demand Schedule, Quantity Demanded : Ans : C
a) Varies Directly with price
b) Varies proportionately with price
c)Varies Inversely with Price
d) Is Independent of price

Q. 2 If an increase in income of the consumer leads to decrease in demand then the goods in question are : Ans : C
a) Normal Goods
b) Luxury Goods
c) Inferior Goods
d) Substitute goods

Q. 3 A Buyer's willingness to pay is that : Ans: D
a) Minimum amount he is willing to pay for a commodity
b) Producer Surplus
c) Consumer Surplus
d) Maximum amount he is willing to pay for a commodity

Q. 4 If a price of good A increases relative to price of substitute B & C, the demand for : Ans : C
a) B Will Increase
b) C Will Increase
c) B and C will Increase
d) B and C will Decrease

Q. 5 Contraction in demand is a result of : Ans : B
a) Decrease in Number of Consumers
b) Increase in the price of Concerned Goods
c) Increase in the price of Other Goods
d) Decrease in the Income of the Consumers

Q. 6 A increase in demand can result from : Ans : B
a) A Decline in Market price
b) An Increase in Income
c) A Reduction in Price of Substitutes
d) An Increase in the Price of Compliments

UNIT-2 CONSUMER BEHAVIOR

W H A T I S U T I L I T Y

- Utility is the want satisfying power of a commodity.

  OR

- Utility is satisfaction and it is subjective in nature.

Utility $\neq$ Usefulness

TWO IMPORTANT THEORIES OF CONSUMER BEHAVIOR

- By Alfred Marshall : Marginal Utility Analysis or Cardinal Utility Analysis
- By Hicks & Allen : Indifference Curve Analysis or Ordinal Utility Analysis

WHY DOES LAW OF DEMAND OPERATES ?

(1) LAW OF DIMINISHING MARGINAL UTILITY(CARDINAL APPROACH)

As the consumer goes on increasing the units of a commodity consumed, every additional units gives lesser and lesser satisfaction.

(a) When TU rises MU falls (positive)

(b) When TU maximum MU = 0

(c) When TU falls MU falls (negative)

MU = It is the additional utility derived from the consumption of an additional unit of a commodity.

$MU = TU_n - TU_{n-1}$

OR

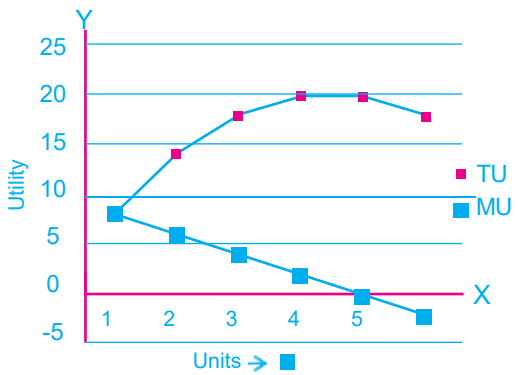
$MU = \frac{\text{Change in TU}}{\text{Change in units}}$

where u = Units of Commodity Consumed.

RELATIONSHIP BETWEEN TU & MU

Ex. Suppose consumer wants to consume ice-cream.

Units of Icecream	TU	MU
1	8	8
2	8+6 = 14	6
3	14+4 = 18	4
4	18+2 = 20	2
5	20+0 = 20	0
6	20+(-2)=18	-2



1) Till MU remains +ve, TU increases. 2) When MU is zero, TU is maximum. 3) When MU is –ve, TU decreases.



→ Steeper

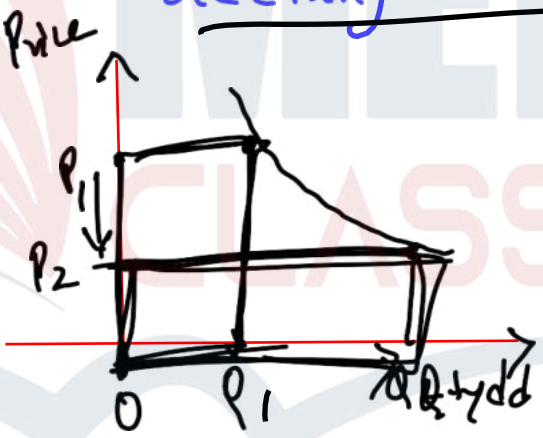
(5) Unitary Elastic dd $ep = 1$.

5/5 =
4/4 =
3/3 =

∴ Δ in Qty dd = ∴ Δ in price

P ↑ 50 ∴ Q ↓ 50 ∴

rectangular hyperbola.



Methods of Measuring PE. [ep].

1) percentage Method / Mathematical Method / prop. Method

$$ep = \frac{\% \text{ Δ in Qty dd}}{\% \text{ Δ in price}} = \left(\frac{\Delta X}{X} \times \frac{P}{\Delta P}\right)$$

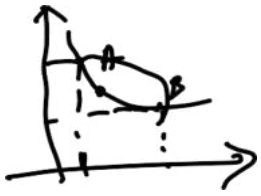
2) ARC ELASTICITY (PROF. BAUMOL)

$$e_p = \frac{\Delta Q}{\frac{Q_1+Q_2}{2}} \times \frac{P_1+P_2/2}{\Delta P}$$

Org Qty = X_1
Final Qty = X_2
Avg dd ⇒ $X_1+X_2/2$
Avg price ⇒ $P_1+P_2/2$

$$= \left(\frac{\Delta Q}{Q_1+Q_2} \times \frac{P_1+P_2}{\Delta P}\right)$$

$$= +\left(\frac{Q_1-Q_2}{Q_1+Q_2} \times \frac{P_1+P_2}{P_1-P_2}\right)$$



Q. Solve the above sum by ARC EL.

$$e_p = \frac{\Delta Q}{Q_1+Q_2} \times \frac{P_1+P_2}{\Delta P}$$

$$= 1.28$$

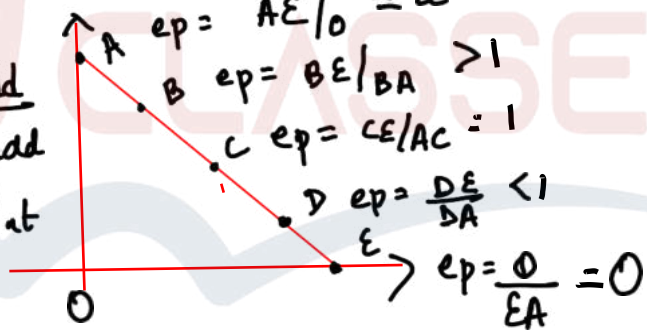
$$\frac{\Delta Q}{Q} \times \frac{P}{\Delta P}$$

$$\frac{Q_1-Q_2}{Q} \times \frac{P}{P_1-P_2}$$

3rd Method! ⇒ Geometric Method / Point EL.

e_p = Lower seg of the dd / upper seg of the dd

C is the mid point
AC = CE



4th Method! ⇒ $Q = -100+10p$; find e_p when price is 15/-

$P = 15$; $Q = -100+10\times15$

$= 50$ u

$$e_p = -\left(\frac{dQ}{dP} \times P/_{QU}\right)$$ [when dd equation is given]

$e_p = 10 \times 15/_{50}$

$= -3$

$Q = -100+10p$

Differentiating both the sides wrt price.

$$\frac{dQ}{dP} = 0 + 10$$

$$= 10$$

5th Method:- Total Rev / Total Exp Method.

Rel b/w Price & T.E.

Price P↓	Qty dd	Total Exp (TE) = (P×Q)	Rel b/w P & TE	ep
10	1	10		
9	2	18	Rise: TE = P×Q, (↑) = (↓ x ↑)	Inverse	ep > 1
8	3	24		
7	4	28		
6	5	30	Constant	Constant	ep = 1
5	6	30		
4	7	28	Fall. TE = P×Q, ↓ = (↓ x ↑)	Direct	ep < 1
3	8	24		
2	9	18		Inelastic
1	10	10		

Price Fall
Qty dd
Fall
Fall
Fall.

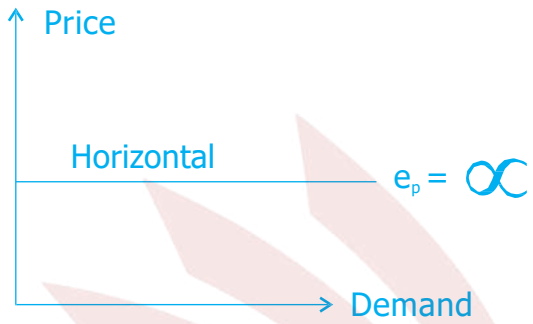
Cons = ↓ x ↑

$$TE = P \times Q$$
$$\uparrow = \downarrow \times \uparrow$$

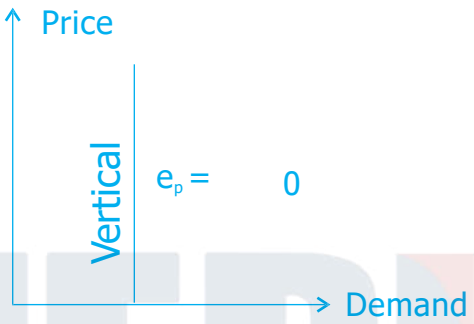
SPM CMA FINAL | CHAPTER 3 | (UNIT-2)

PRICE ELASTICITY (E_p)

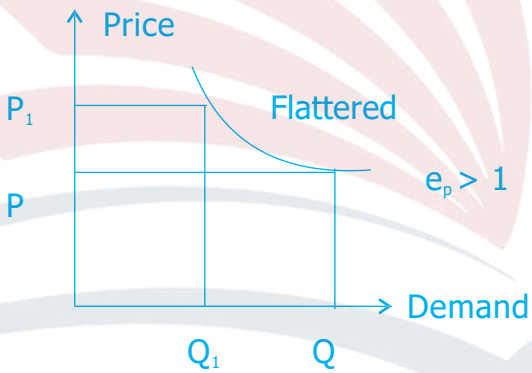
- It is the measure of degree of responsiveness of change in quantity demanded of a commodity due to change in its price of own commodity. (ceteris paribus)
- $e_p = \frac{\%\text{Change in Quantity Demanded}}{\%\text{ Change in price}}$



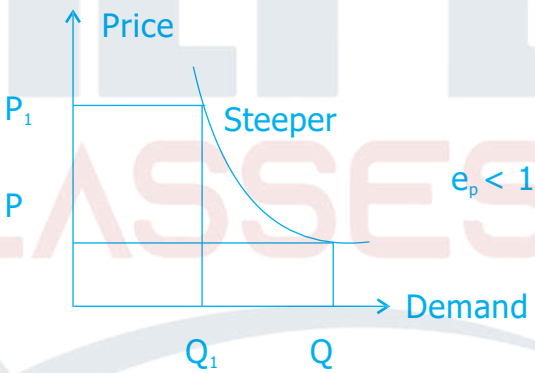
PERFECTLY ELASTIC



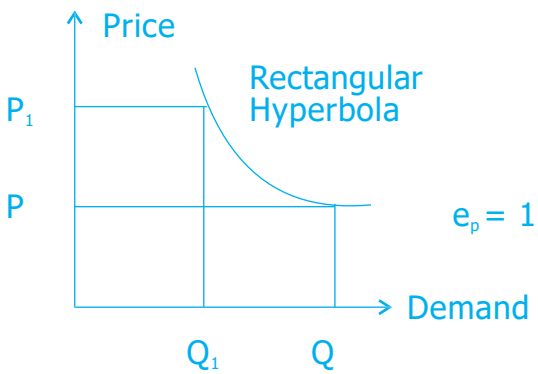
PERFECTLY INELASTIC



HIGHLY ELASTIC



HIGHLY INELASTIC



UNITARY ELASTIC

METHODS OF MEASURING PRICE ELASTICITY

DETERMINANTS OF PRICE ELASTICITY

(a) Nature of Commodity :-

(b) Availability of Substitutes :-

(c) Proportion of Income spent :-

(d) Number of uses :-

(e) Durability of the commodity :-

(f) Habitual Nec. :-

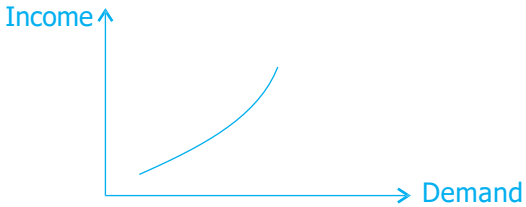
INCOME ELASTICITY (E_I)

It is the measure of degree of responsiveness of change in quantity demanded of a commodity due to change in Income of the consumer (Ceteris Paribus)

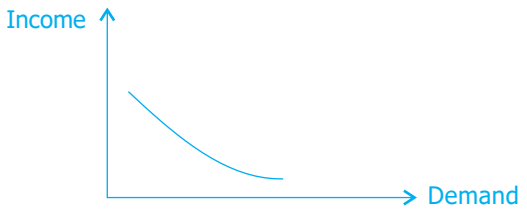
$$e_i = \frac{\%\text{ Change in Quantity Demanded}}{\%\text{ Change in Income of Consumer}}$$

TYPES OF ELASTICITY (E_I)

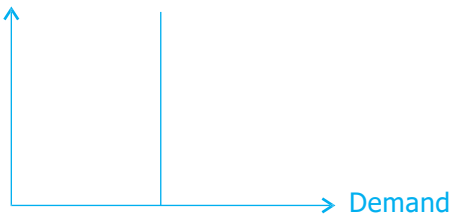
+ve i.e. ($e_i > 0$) = Normal Goods



-ve i.e. ($e_i < 0$) = Inferior Goods



zero i.e. (e_i = 0) = No relation



(e_i > 1 = Denotes Luxury Goods)

(e_i < 1 = Denotes basic necessary goods.

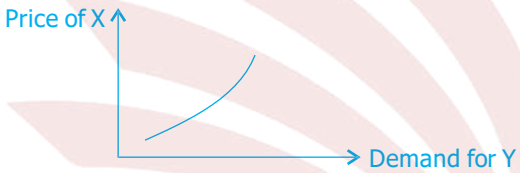
CROSS PRICE ELASTICITY (E_c)

It is the measure of degree of responsiveness of change in quantity demanded of one commodity due to change in price of its related goods (Ceteris Paribus)

$$e_c = \frac{\%\text{ Change in Quantity Demanded of X}}{\%\text{ Change in Price of Y}}$$

TYPES OF ELASTICITY

+ve CPE (ec > 0) = Substitute Goods



-ve CPE (ec < 0) = Complementary Goods



zero i.e. (ec = 0) = No Relation



Illustration 1:- The price of 1kg of tea is ` 30. At this price 5kg of tea is demanded. If the price of coe rises from ` 25 to ` 35 per kg, the quantity demanded of tea rises from 5kg to 8kg. Find out the cross price elasticity of tea.

Solution :- (1.5)

Illustration 2:- The price of 1 kg of sugar is ` 50. At this price 10 kg is demanded. If the price of tea falls from ` 30 to ` 25 per kg, the consumption of sugar rises from 10 kg to 12 kg. Find out the cross price elasticity and comment on its value.

Solution :- (-1.2)

Advertisement Elasticity

Advertisement elasticity of sales or promotional elasticity of demand is the responsiveness of a good's demand to changes in ▪rm's spending on advertising. The advertising elasticity of demand measures the percentage change in demand that occurs given a one percent change in advertising expenditure. Advertising elasticity measures the effectiveness of an advertisement campaign in bringing about new sales.

Advertising elasticity of demand is typically positive. Higher the value of advertising elasticity greater will be the responsiveness of demand to change in advertisement. Advertisement elasticity varies between zero and in▪nity. It is measured by using the formula;

$$Ea = \frac{\%\text{ Change in demand}}{\%\text{ change in spending on advertising}}$$

$$Ea = \frac{\Delta Qd / Qd}{\Delta A / A}$$

Where ΔQd denotes change in demand.

ΔA denotes change in expenditure on advertisement.

Qd denotes initial demand.

A denotes initial expenditure on advertisement.

Elasticity	Interpretation
Ea = 0	Demand does not respond to increase in advertisement expenditure.
Ea >0 but < 1	Change in demand is less than proportionate to the change in advertisement expenditure.
Ea = 1	Demand changes in the same proportion in which advertisement expenditure changes.
Ea > 1	Demand changes at a higher rate than change in advertisement expenditure.

As far as a business ▪rm is concerned, the measure of advertisement elasticity is useful in understanding the effectiveness of advertising and in determining the optimum level of advertisement expenditure.

DEMAND FORECASTING

Forecasting of demand is the art and science of predicting the probable demand for a product or a service at some future date on the basis of certain past behaviour patterns of some related events and the prevailing trends in the present. It should be kept in mind that demand forecasting is no simple guessing,

Usefulness :

The very process of forecasting helps in evaluating various forces which aect demand and is in itself a reward because it enables the forecasting authority to know about various forces relevant to the study of demand behaviour.

Scope of Forecasting :

Demand forecasting can be at the international level depending upon the area of operation of the given economic institution. Itcan also be conned to a given product or service supplied by a small rm in a local area.

Types of forecasts

(1) Macro-level forecasting
(ii) Industry- level forecasting
(iii) Firm- level forecasting
(2) Based on time period
(i) Short-term demand for six months or less than one year
(ii) Long-term forecasts two to ·veyears and more.

Demand Distinctions

a) Producer's goods and Consumer's goods

b) Demand for Durable goods and Non-durable goods

c) Derived demand and Autonomous demand

d) Demand for ·rm's product and industry demand

e) Short-run demand and Long-run demand

Factors affecting demand for non-durable consumer goods:

(i) Disposable income:

(ii) Price:

(iii) Demography:

Factors affecting the demand for durable-consumer goods:

(i) A consumer can postpone the replacement of durable goods.

(ii) These goods require special facilities for their use e.g. roads for automobiles,

(iii) Replacement demand is an important component of the total demand for durables.

Methods of demand Forecasting

(i) Survey of Buyers' Intentions:

a) Complete enumeration method where nearly all potential customers are interviewed about their future purchase plans
b) Sample survey method under which only a scientifically chosen sample of potential customers are interviewed
c) End–use method, especially used in forecasting demand for inputs, involves identification of all null users, fixing suitable technical norms of consumption of the product under study, application of the norms to the desired or targeted levels of output and aggregation.

(ii)Collective opinion method: This method is also known as sales force opinion method or grass roots approach. Firms having a wide network of sales personnel can use the knowledge, experience and skills of the sales force to forecast future demand. Under this method, salesmen are required to estimate expected sales in their respective territories.

(iii)Expert Opinion method: The Delphi technique, developed by Olaf Helmer at the Rand Corporation of the USA, provides a useful way to obtain informed judgments from diverse experts by avoiding the disadvantages of conventional panel meetings.

(iv)Statistical methods:

(a) Trend Projection method:
a) Fitting trend equation or least square method.
b) Graphical Method:
c) Fitting trend equation:
d) Regression analysis:

(v)Controlled Experiments: Under this method, future demand is estimated by conducting market studies and experiments on consumer behavior under actual, though controlled, market conditions. This method is also known as market experiment method.

(vi)Barometric method of forecasting: The various methods suggested till now are related with the product concerned. These methods are based on past experience and try to project the past into the future.

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→ Steeper

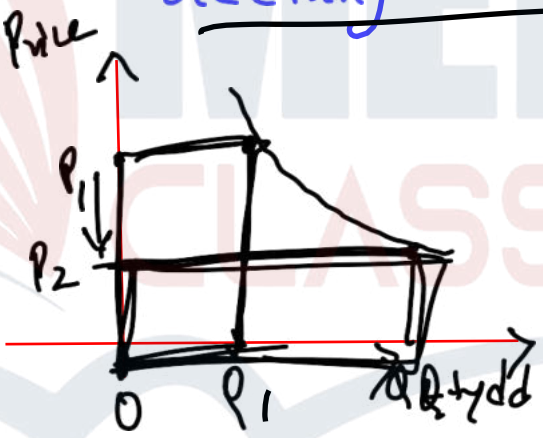
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P ↑ 50 ∴ Q ↓ 50 ∴

rectangular hyperbola.



Methods of Measuring PE. [ep].

1) percentage Method / Mathematical Method / prop. Method

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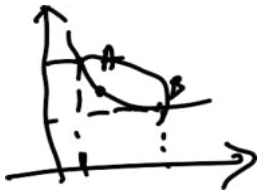
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Org Qty = X_1
Final Qty = X_2
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Avg price ⇒ $P_1+P_2/2$

$$= \left(\frac{\Delta Q}{Q_1+Q_2} \times \frac{P_1+P_2}{\Delta P}\right)$$

$$= +\left(\frac{Q_1-Q_2}{Q_1+Q_2} \times \frac{P_1+P_2}{P_1-P_2}\right)$$



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$$= 1.28$$

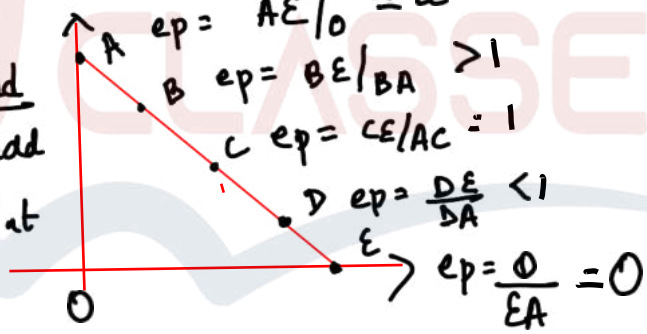
$$\frac{\Delta Q}{Q} \times \frac{P}{\Delta P}$$

$$\frac{Q_1-Q_2}{Q} \times \frac{P}{P_1-P_2}$$

3rd Method! ⇒ Geometric Method / Point EL.

e_p = Lower seg of the dd / upper seg of the dd

C is the mid point
AC = CE



4th Method! ⇒ $Q = -100+10p$; find e_p when price is 15/-

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Differentiating both the sides wrt price.

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$$= 10$$

5th Method:- Total Rev / Total Exp Method.

Rel b/w Price & T.E.

Price P↓	Qty dd	Total Exp (TE) = (P×Q)	Rel b/w P & TE	ep
10	1	10		
9	2	18	Rise: TE = P×Q, (↑) = (↓ x ↑)	Inverse	ep > 1
8	3	24		
7	4	28		
6	5	30	Constant	Constant	ep = 1
5	6	30		
4	7	28	Fall. TE = P×Q, ↓ = (↓ x ↑)	Direct	ep < 1
3	8	24		
2	9	18		Inelastic
1	10	10		

Price Fall
Qty dd
Fall
Fall
Fall.

Cons = ↓ x ↑

$$TE = P \times Q$$
$$\uparrow = \downarrow \times \uparrow$$

SPM CMA FINAL

Chapter3-unit 3(Revenue)

CONCEPT OF TOTAL & AVERAGE REVENUE

Total Revenue :

- It refers to the amount of money which a firm realizes by selling certain units of a commodity
- Symbolically

TR = P × Q

$TR \Rightarrow 5 \times 10 = 50$ $TR_{10} = 50$ $TR_{11} = 55$ $= 5$

$MR_{11} \Rightarrow TR_{11} - TR_{10} \Rightarrow 55 - 50 = 5$

Average Revenue :

- Average revenue is the revenue earned per unit of output
- It is nothing but price of one unit of output because price is always per unit of a commodity
- Symbolically

AR = TR/Q

(AR = P)

$\frac{T \cdot R}{n}$ $\frac{50}{10}$ $= 5$ $= A \cdot R = P$

$AR = \frac{TR}{Q} = \frac{P \times Q}{Q} = P$

Marginal Revenue :

- Marginal revenue is the change in total revenue resulting from the sale of an additional unit of the commodity

Symbolically

$MR = \frac{\Delta TR}{\Delta Q}$

$MR_n \Rightarrow TR_n - TR_{n-1}$ $\frac{\Delta TR}{\Delta n}$

BEHAVIOURIAL PRINCIPLES

Principle 1:

- A firm should not produce at all if total revenue from its product does not equal or exceed its total variable cost.

Principle 2 :

- It will be profitable for the firm to expand output whenever marginal revenue is greater than marginal cost
- It will expand the output until marginal revenue equals marginal cost

Summary

- The term market is a place where buyers and sellers bargain over a commodity for a price.
- Markets can be classified in various form
- The firms can operate with a complex set of objectives and under various constraints

TYPES OF MARKET

- **Perfect Competition** (Pure Competition)
- **Monopoly**
- **Imperfect Competition**
  - Oligopoly
  - Monopolistic Competition

Perfect Competition (Agriculture Market) , Dairy Products. (It is not a real world market)

1. Large Numbers of buyers and sellers.
2. Goods are homogeneous in nature.
3. Free entry and free exit of the firm in long run.
4. Absence of selling cost.
5. Absence of transportation cost.
6. Perfect knowledge of buyers and sellers.
7. Perfect mobility of factors of production.

AR = P = MR

Pure Competition = 1+2+3

Price per Unit	Units Sold	TR (P x Q)	AR = P	MR
5	1	5	5	-
5	2	10	5	5
5	3	15	5	5
5	4	20	5	5
5	5	25	5	5

MP is decided by market forces (D & S interaction)

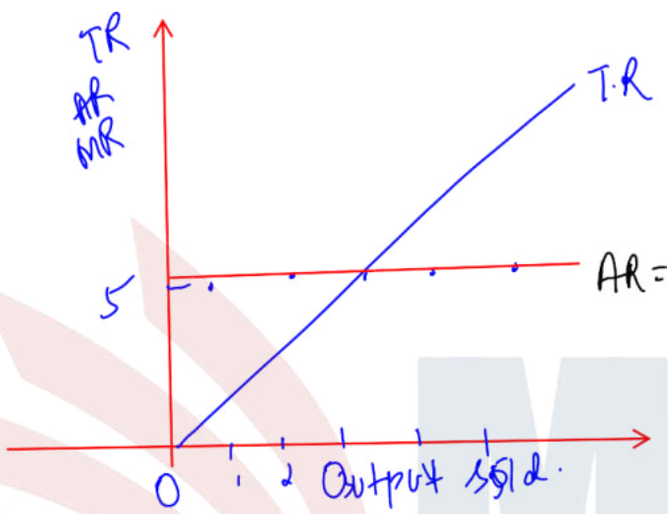
Output

REVENUE

∴ Price remains constant, it is a given datum so change in TR also remains constant

AR = MR

DIAGRAM SHOWING TR, MR, AR



(8) P.C is devoid of competition.

FILL IN THE BLANKS

(1) The shape of T.R curve in competitive market is straight line upward sloping

(2) The shape of AR/MR in this market is straight line horizontal to the x-axis.

(3) The Relation b/w AR & MR in P.C is AR = P = MR.

(4) Market price in P.C is determined by market forces/ intersection of demand & supply curve.

(5) firm in P.C are Price takers

demand.
known as price line & demand revenue
The elasticity of AR curve in P.C is perfectly elastic (ep=∞)

DEFINITION OF MONOPOLY

Monopoly is a Market situation in which there is a Single Seller, there are no Close Substitutes for Commodity it produces, there are Barriers to Entry.

- Koutsoyiannis

Pure or Absolute Monopoly exists when a Single Firm is the Sole Producer for a Product for which there are no Close Substitutes.

- Mc Connel

FEATURES

Eg → Electricity

1. Single Seller and large number of buyers.
2. No close substitute for a product. (homogeneous)
3. No free entry and free exit.
4. No selling cost.
5. A monopolist can practice Price Discrimination.

Price per Unit	Units sold	TR (P×Q)	AR TR/Q	MR
10	1	10	10	–
9	2	18	9	8
8	3	24 Rise	8	6
7	4	28	7	4
6	5	30 Constant	6	2
5	6	30	5	0
4	7	28 Fall	4	-2
3	8 Rise	24	3	-4
2	9	18	2	-6
1	10	10	1	-8

AR = P & MR

AR > MR

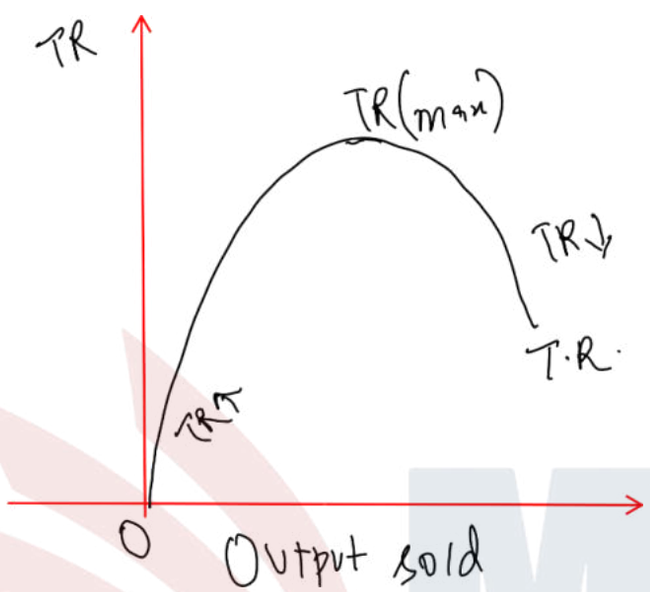
∴ As price falls, demand rises so, AR curve is downward slopping.

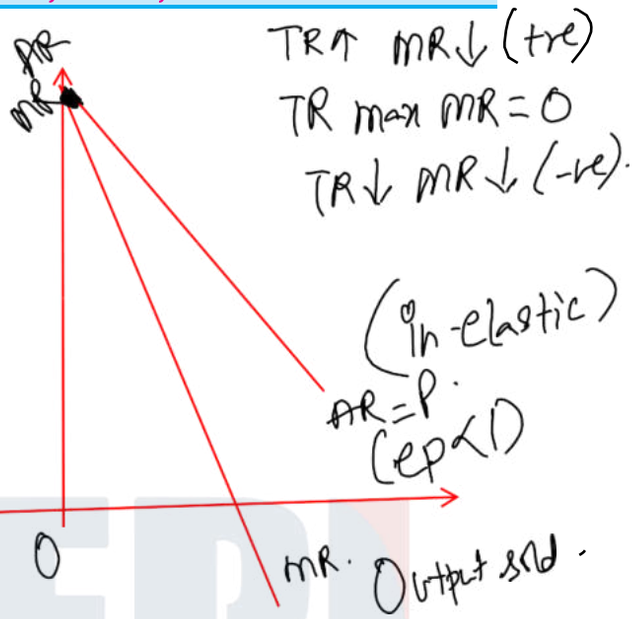
Slope of MR curve is twice of AR curve.

OR slope of AR = ½ slope of MR.

DIAGRAM SHOWING TR, MR, AR

AR = P ≥ MR





FILL IN THE BLANKS

(1) Shape of TR curve in Monopoly is inverted 'U' shaped.

(2) Shape of AR & MR curve in Monopoly is downward sloping

3) Relationship b/w AR & MR in this market is AR = P ≥ MR.

(4) Price Elasticity of AR curve is highly in-elastic /ep<1/ becoz of No close substitutes. steeper.

(5) In monopoly market the difference between firm & industry dis-appears.

(6) Monopolist has considerable control over the market price & they are PRICE MAKERS.

(7) A monopolist very well knows that i

PRICE DISCRIMINATION UNDER MONOPOLY

The Act of Selling the same Article produced under Single Control at a different Price is known as Price Discrimination.

- Mrs. Joan Robinson

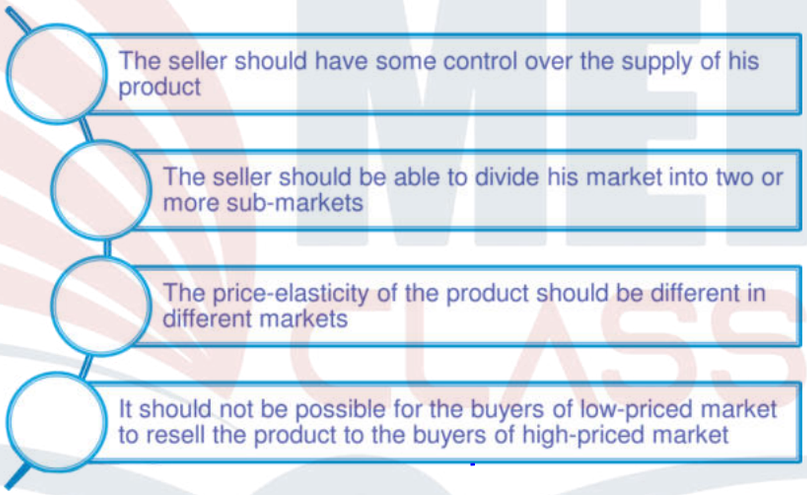
Price Discrimination refers strictly to the practice by a Seller to charging different Prices from different Buyers for the same Good.

- J.S.Bains

Price discrimination is a method of pricing adopted by the monopolist in order to earn abnormal profit
It refers to the practices of charging different prices for the different unit of the same commodity

- Personal Price Discrimination
- Place Price Discrimination

CONDITION FOR PRICE DISCRIMINATION



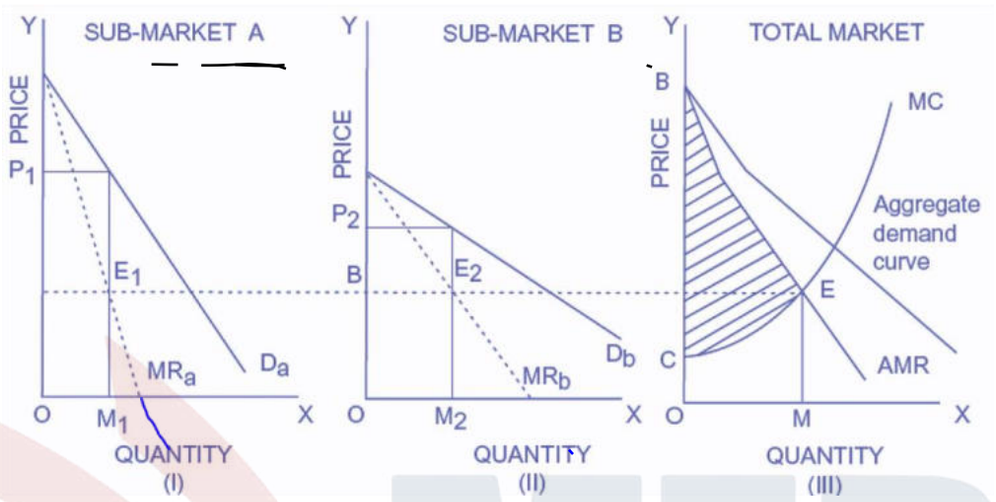
OBJECTIVES OF PRICE DISCRIMINATION

- To earn maximum profit
- To dispose of surplus stock
- To enjoy the economies of scale
- To capture foreign markets
- To secure equity through pricing.

FORMS OF PRICE DISCRIMINATION BY MONOPOLISTS

- Personal
- Local Area
- Income
- Size of the purchase
- Season
- Age of the consumer

PRICE DISCRIMINATION IN SUB-MARKETS



MONOPOLISTIC COMPETITION (REAL WORLD MARKET)

1. Large number of buyers and sellers.
2. Goods are heterogeneous / differentiated / close substitutes are available.
3. Free entry and free exit of the firm in the long run.
4. Selling cost is present.
5. Both price taker and price maker.

AR > MR

EXAMPLES OF MONOPOLISTIC COMPETITION

Banks	Sporting Goods
Radio Stations	Fish and Seafood
Clothing	Jewelry
Computers	Health Spas
Frozen Foods	Apparel Stores
Canned Goods	Convenience Stores

DIAGRAM SHOWING TR, MR, AR

FILL IN THE BLANKS

(1) The shape of TR curve in monopolistically competitive market is Inverted 'U'

(2) The shape of AR & MR curve here is downward sloping / flattened

(3) The Relationship between AR & MR curve is AR = P > MR.

(4) The price Elasticity of AR curve is elastic (ep > 1)

(5) Monopolistically competitive market is full of Competition

REVENUE

MA

OLIGOPOLY

Features

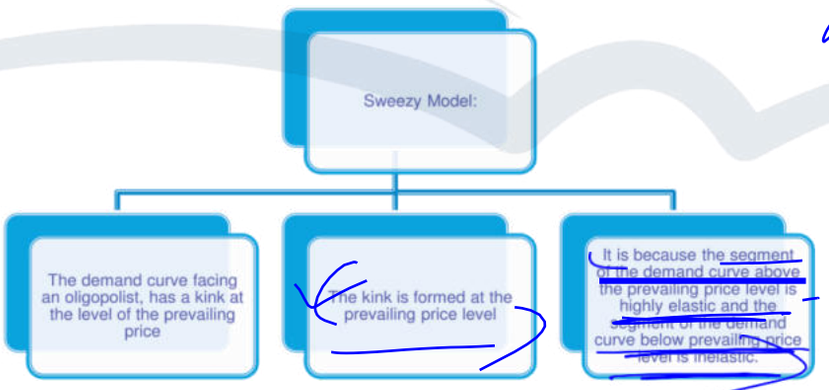
1. Few sellers and large number of buyers.
2. Goods may be homogeneous or heterogeneous.
3. Selling cost may or may not be there.
4. Substantial barriers to free entry and free exit.
5. Both price makers and takers.
6. Close Interdependence.
7. Very intense competition.
8. Example : Cold Drink Industry, Car Industry.

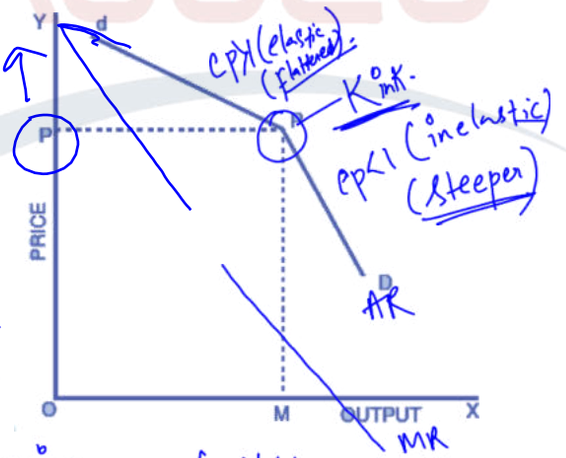
∴ No AR or MR curve exists in this market

However, under special assumptions point can be obtained :

1. Assumptions : Price remains very sticky/rigid/inflexible.
2. Name of the Economist : PAUL SWEEZY
3. Shape of AR curve : Kinked at the Ruling Market Price.
4. Shape of MR Curve : downward sloping but dis-continuous.

KINKED DEMAND CURVE





The greater is the difference in price-elasticity, the greater will be the Kink & greater is the Kink, greater will be the dis-continuity in MR curve.

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2 The responsiveness of price increase > price Decrease in Oligopoly Market.

Types of Oligopoly: Pure oligopoly or perfect oligopoly occurs when the product is homogeneous in nature, e.g. Aluminium industry. This type of oligopoly tends to process raw materials or produce intermediate goods that are used as inputs by other industries. Notable examples are petroleum, steel, and aluminium. Differentiated or imperfect oligopoly occurs when goods sold is based on product differentiation, e.g. Talcum powder.

Open and closed oligopoly: In an open oligopoly market new firms can enter the market and compete with the existing firms. But, in closed oligopoly entry is restricted.

Collusive and Competitive oligopoly: When few firms of the oligopoly market come to a common understanding or act in collusion with each other either in fixing price or output or both, it is collusive oligopoly. When there is absence of such an understanding among the firms and they compete with each other, it is called competitive oligopoly.

Partial or full oligopoly: Oligopoly is partial when the industry is dominated by one large firm which is considered or looked upon as the leader of the group. The dominating firm will be the price leader. In full oligopoly, the market will be conspicuous by the absence of price leadership.

Syndicated and organized oligopoly: Syndicated oligopoly refers to that situation where the firms sell their products through a centralized syndicate. Organized oligopoly refers to the situation where the firms organize themselves into a central association for fixing prices, output, quotas, etc.

OTHER FORMS OF MARKET:-

(1) Monopsony :→ A form of market characterized by a single buyer. Eg → factor Market.

(2) Oligopsony :→ A form of market with small no. of buyers.

(3) Duopoly :→ It is a sub-set of oligopoly which is characterized by two sellers.

(4) Bilateral Monopoly → Market with 1 seller & 1 buyer.

Types/Degrees of PRICE DISCRIMINATION:- (3).

(1) First Degree of P.D ⇒ It is a form of P.D where seller fixes the price in such a manner that will take away the entire consumer surplus

(2) Second Degree of P.D ⇒ Here the seller fixes a price in such a manner that will take away a part of the consumer surplus.

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SUMMARY

Form of Market Structure	No. of Firms	Nature of Product	Price Elasticity of Demand of a Firm	Degree of Control over Price
(a) Perfect Competition	A Large no. of Firms	Homogeneous	Infinite	None
(b) Monopoly	One	Unique Product with close Substitute	Small	Very Considerable
(c) Imperfect Competition				
(i) Monopolistic Competition	A Large no. of Firms	Differentiated Products	Large	Some
(ii) Oligopoly	Few Firms	Homogenous or Differentiated Product	Small	Some

RELATIONSHIP BETWEEN AR, MR, TR AND PRICE ELASTICITY OF DEMAND

It is to be noted that marginal revenue, average revenue and price elasticity of demand are uniquely related to one another through the formula:

$$MR = AR \times \frac{e-1}{e}$$ Where e = price elasticity of demand

Thus if $e = 1$, $MR = AR \times \frac{1-1}{1} = 0$

and if $e > 1$, MR will be positive

and if $e < 1$, MR will be negative

$e = 3$, $AR = 5$, find MR

$$MR = 5 \times \left(\frac{3-1}{3}\right) = 10/3 = 3.33 \text{ Ans.}$$

$e = 5$, $AR = 10$, find M.R.

$$MR = AR \times \left(\frac{e-1}{e}\right)$$

$$= 10 \times \left(\frac{5-1}{5}\right)$$

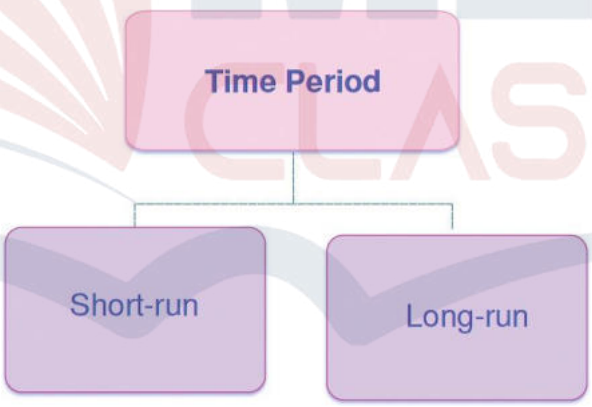
$$= 8 \text{ Ans.}$$

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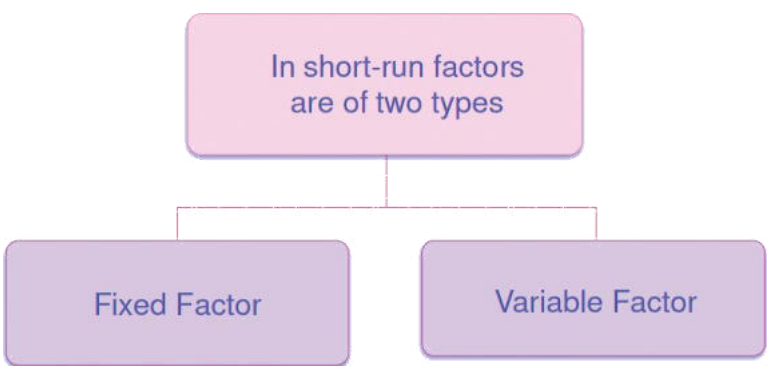
SPM CMA FINAL-COST (SECTION-4)

COST FUNCTION

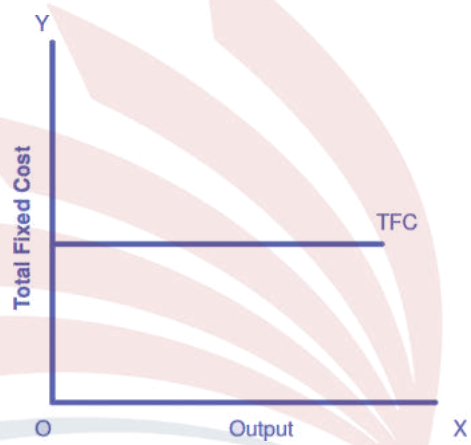
- It refers to the mathematical relation between cost of a product and the various determinants of costs.
- $C = f(Q_x)$
- C = cost
- f = function
- (Q_x) = quantity produced

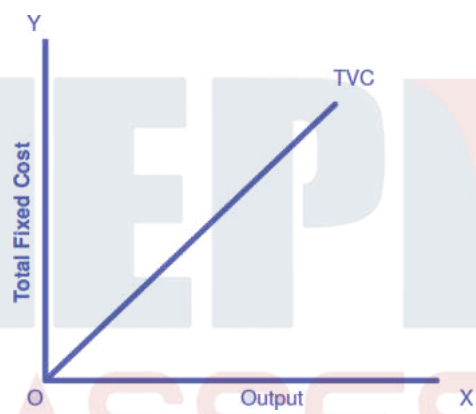


SHORT RUN COST



Fixed Cost	Variable Cost
1. Fixed cost are those cost that are independent of the level of output produced. 2. Even when output level is '0' they have to be incurred. 3. Shape of the TFC curve is straight line horizontal to the X-axis. 4. TFC curve starts from a point above the origin. 5. Example : Salary of Watchman, Depreciation, Rent paid, Property Taxes	1. Variable cost are those that are dependent on the level of output produced. 2. Variable cost remains '0' at '0'th output level. 3. Shape of variable cost is inverted 'S' 4. VC curve starts from origin. 5. Example : Cost of raw material, Fuel, Wages





At 0th level of Output :- TVC = 0

TC = TFC + TVC

= TFC + 0

= TFC

i.e., TC = TFC (At Output = 0)

OUTPUT	0	1	2	3	4
TOTAL COST	100	150	260	370	400
TOTAL FIXED COST					
TOTAL VARIABLE					

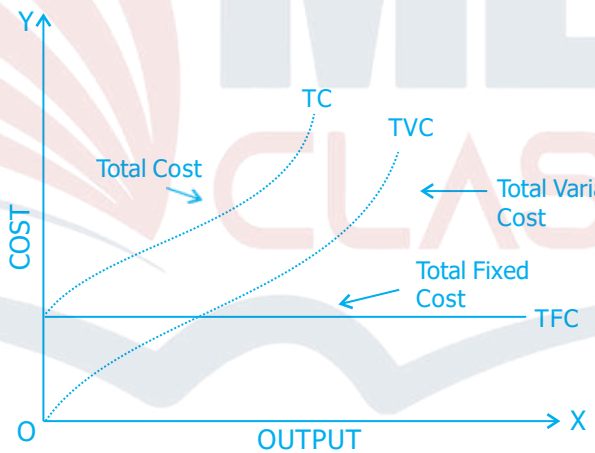
Find TFC & TVC

WHY MARGINAL COST CURVE IS U-SHAPED?

- Due to the operation of Law of variable proportion.
- In the beginning due to increasing returns, Marginal cost falls.
- Then after due to diminishing returns, Marginal cost rises.



TFC, TVC & TC



The Gap between TC & TVC denotes ..... & the Gap remains .....

CONCEPT OF AVERAGE TOTAL COST

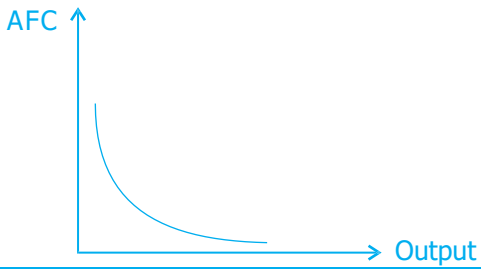
$$\frac{TC}{Q} = \frac{TFC}{Q} + \frac{TVC}{Q}$$

$$\frac{ATC}{AC} = AFC + AVC$$

AVERAGE FIXED COST

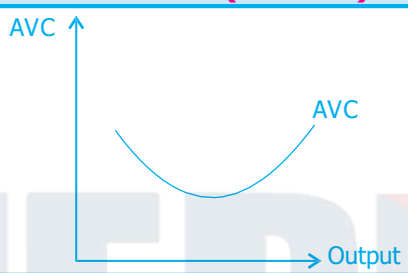
(a) When Quantity(Q) rises, TFC remaining constant, AFC falls.

(b) AFC is a rectangular hyperbola / downward sloping.



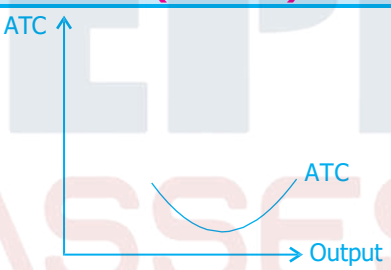
AVERAGE VARIABLE COST (AVC)

AVERAGE VARIABLE COST (AVC) is ' U ' shaped because of Law of Variable Proportion.



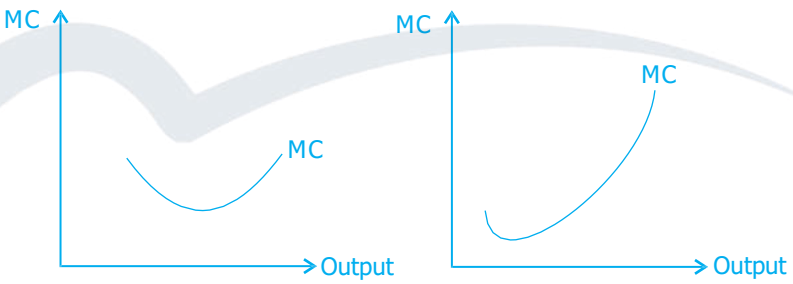
AVERAGE TOTAL COST (ATC)

AVERAGE TOTAL COST (ATC) is ' U ' shaped because of Law of Variable Proportion.



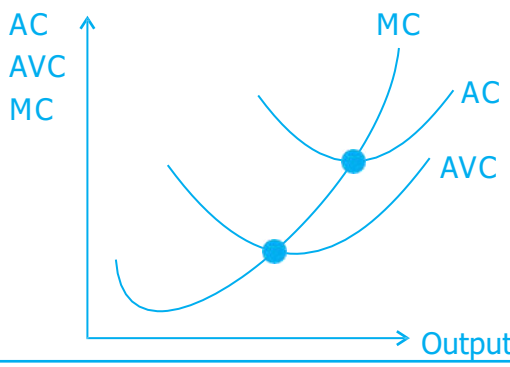
MARGINAL COST CURVE (MC)

MARGINAL COST CURVE (MC) is ' U ' shaped.



RELATIONSHIP BETWEEN AVERAGE COST CURVE (AC) & MARGINAL COST CURVE (MC)

MARGINAL COST CURVE (MC) is ' U ' shaped.



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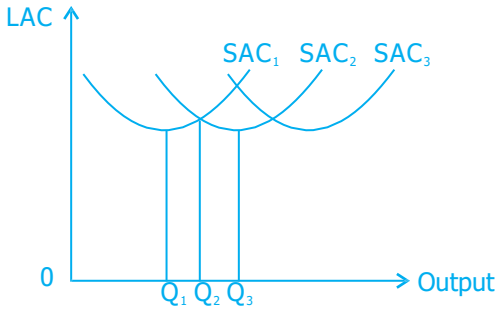
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SHORT RUN COSTS

Units of Output	TFC	TVC	TC	AFC	AVC	ATC	MC
0	20	0	20	-	-	-	-
1	20	30	50	20	30	50	30
2	20	45	65	10	22.50	32.50	15
3	20	55	75	6.67	18.33	25.00	10
4	20	75	95	5.00	18.75	23.75	20
5	20	110	130	4.00	22.00	26.00	35
6	20	165	185	3.33	27.50	30.83	55

LONG RUN COST

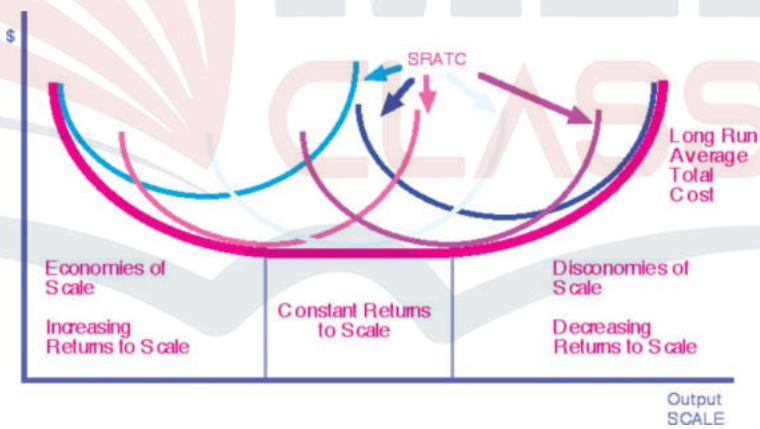
In Long Run all the costs are variable in Nature i.e., TC = TVC



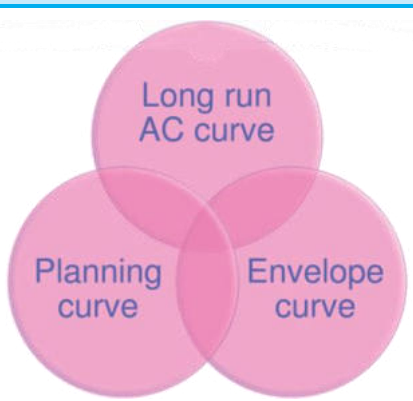
LAC is derived from above SAC curves.

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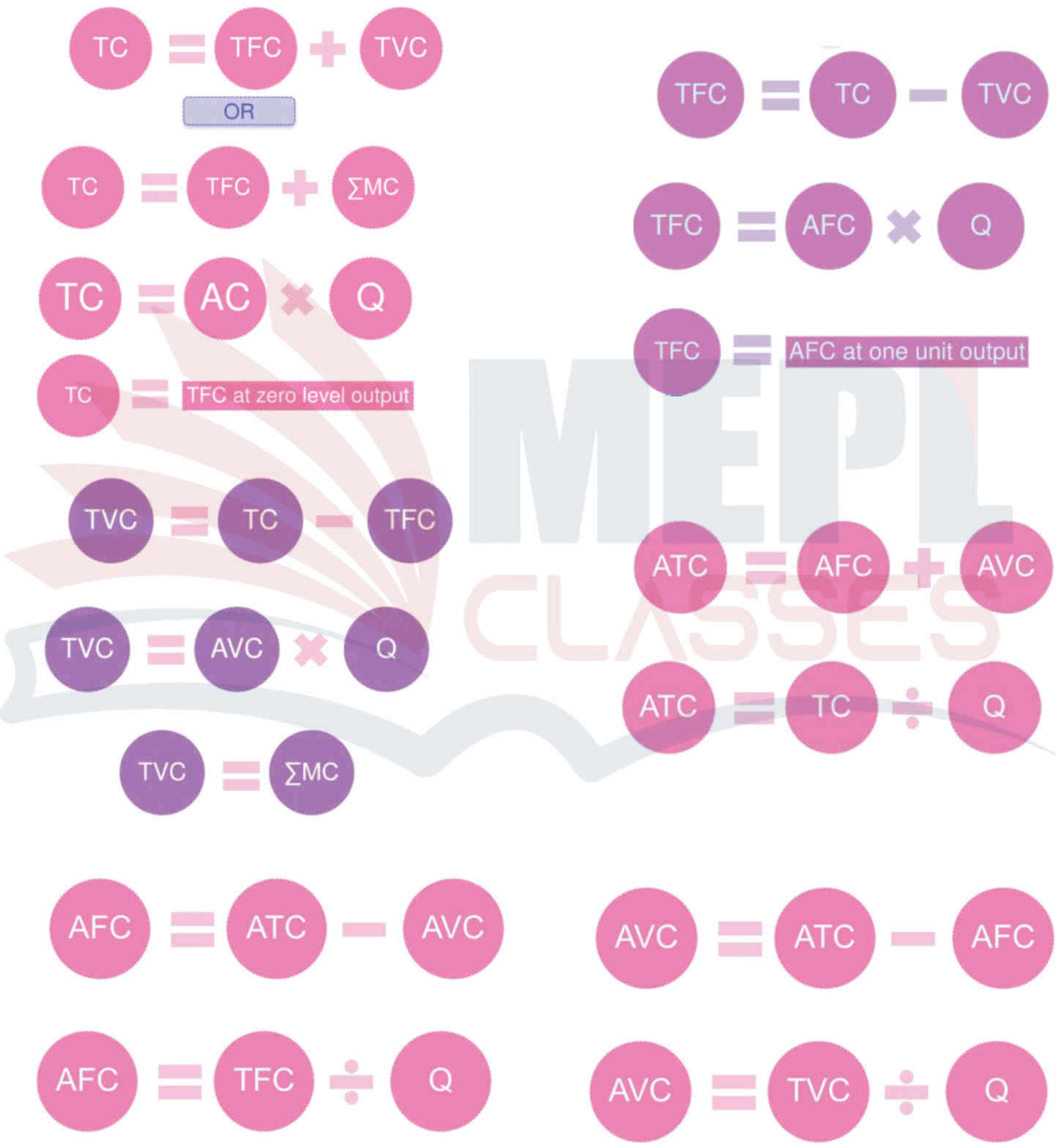
DUE TO CONSTANT RETURNS TO SCALE LAC CURVE IS CONSTANT



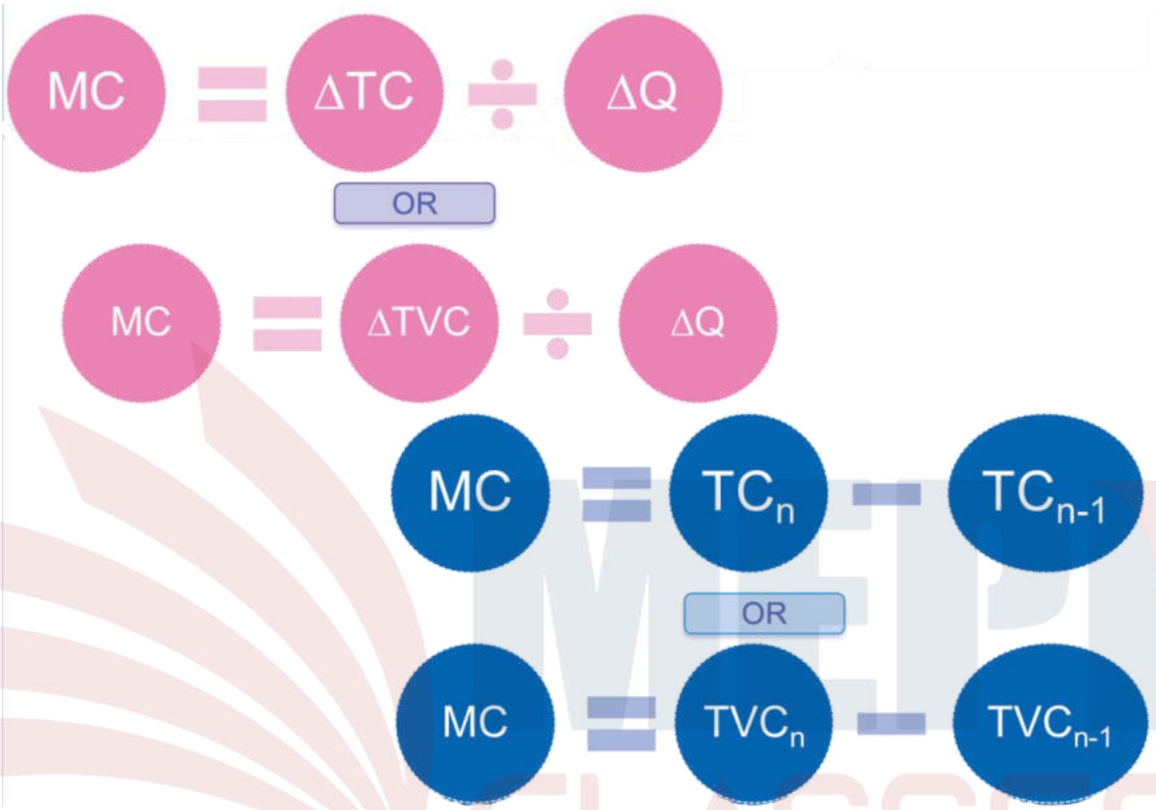
L O N G R U N A C C U R V E



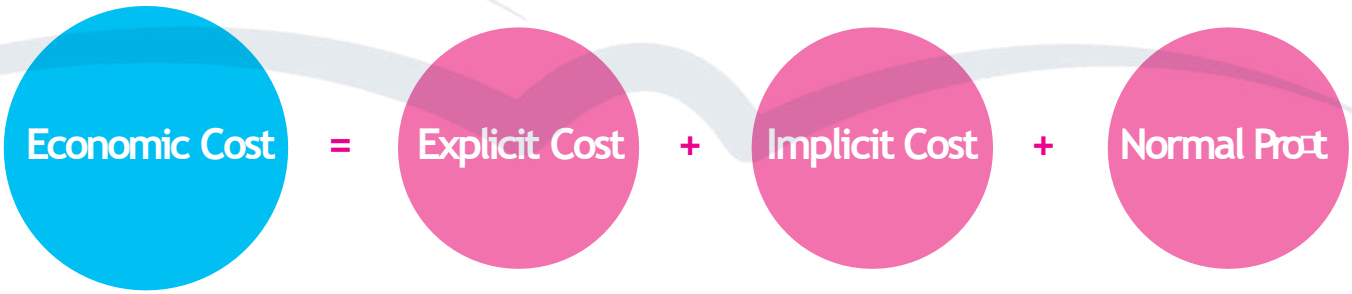
F O R M U L A S


TC = TFC + TVC
OR
TC = TFC + ∑MC
TC = AC × Q
TC = TFC at zero level output
TVC = TC − TFC
TVC = AVC × Q
TVC = ∑MC
TFC = TC − TVC
TFC = AFC × Q
TFC = AFC at one unit output
ATC = AFC + AVC
ATC = TC ÷ Q
AFC = ATC − AVC
AFC = TFC ÷ Q
AVC = ATC − AFC
AVC = TVC ÷ Q

F O R M U L A S



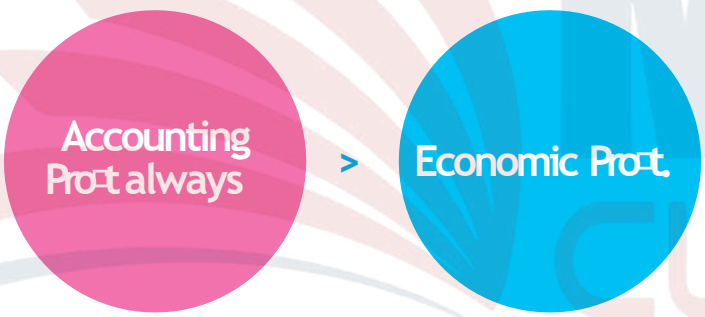
C O N C E P T (M I S C E L L A N E O U S)



Explicit Cost / Accounting Cost	Implicit Cost / Imputed Cost
1. Recorded in the books of accounts.	1. Not recorded in the books of accounts.
2. Cash out▪ow takes place.	2. Cash out▪ow does not takes place.
3. Example : Salary paid to staff.	3. Example : Salary paid to owners.







- Total Revenue = Rs. 500000; Rent paid = Rs. 100000; Salary paid to staff = Rs. 200000; If owner was working somewhere else he would be earning Rs. 250000. Find Accounting Cost, Economic Cost,, Accounting Profit, Economic Profit.

OUTLAY COSTS & OPPORTUNITY COSTS

Outlay Costs	Opportunity Costs
• It involves actual expenditure of funds on say wages, rent, interest etc. • Outlay costs are recorded in the books of accounts.	• It is concerned with the cost of forgone opportunity. • Opportunity Costs are not recorded in the books of accounts.

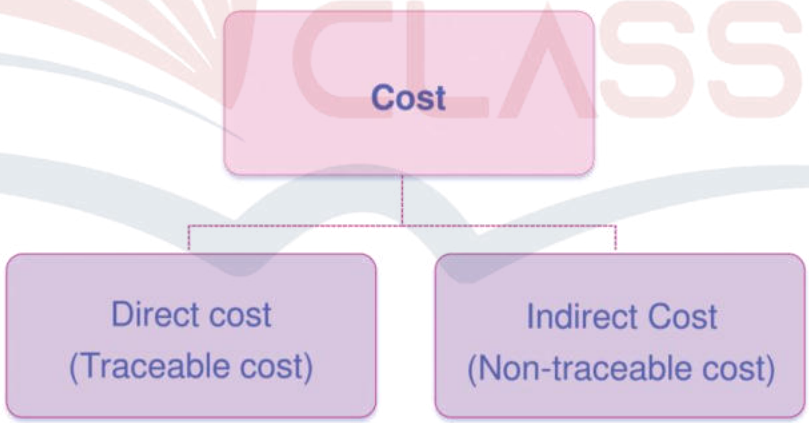
OPPORTUNITY COSTS

- It involves a comparison between the policy that was chosen and the policy that was rejected.

Example :

The opportunity cost of using capital is the interest it can earn in the next best use of capital with equal risk.

TYPES OF COSTS



DIRECT COST

- Cost that are readily identified and are traceable to a particular product, operation or plant.

Example :

Manufacturing cost

INDIRECT COST

- Cost that are neither readily identified and are nor visibly traceable to specific goods, services, operations etc.
- But they bear some functional relationship to production

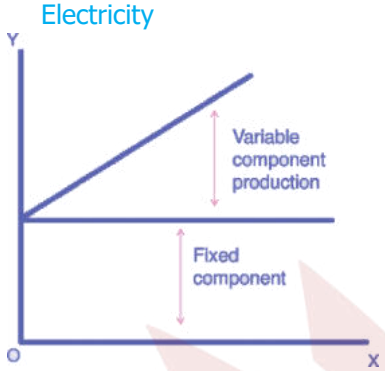
Example : Electric power, Common costs for general operation

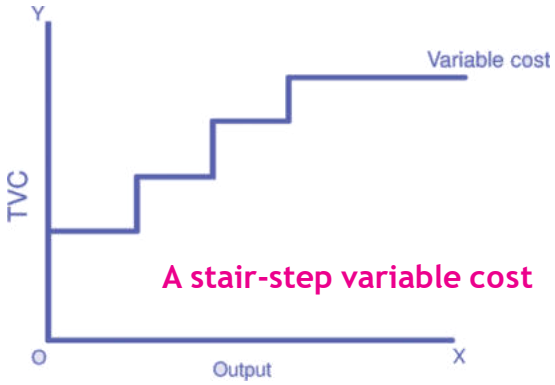
TOTAL SEMI-VARIABLE COSTS

- Some cost which are neither perfectly variables, nor absolutely fixed in relation to the changes in the size of output.

Example :

Electricity





Q. 1 Which Cost Increases Continuously With the Increase in Production? Ans : (d)
a) Average cost
b) Marginal cost
c) Fixed cost
d) Variable cost

Q. 2 Which of the Following Cost Curves is Never U-shaped? Ans : (d)
a) Average cost curve
b) Marginal cost curve
c) Average variable cost curve
d) Average fixed cost curve

Q. 3 Total cost in the short run is classified into fixed costs and variable costs. Which one of the following is a variable cost? Ans: (a)
a) Cost of raw material
b) Cost of equipment
c) Interest payment on past borrowings
d) Payment of rent on building

Q. 4 In the Short Run, When the Output of a Firm Increases, Its Average Fixed Cost: Ans : (b)
a) Increases
b) Decreases
c) Remains constant
d) First declines and then rises

Q. 5 Which One of the Following is Also Known as Planning Curve? Ans : (a)
a) Long run average cost curve
b) short run average cost curve
c) Average variable cost curve
d) Average total cost curve

Q. 6 TThe Efficient Scale of Production is the Quantity of Output That Minimizes: Ans: (b)
a) Average fixed cost
b) Average total cost
c) Average variable cost
d) Marginal cost

Q. 7 The Cost of One Thing in Terms of the Alternative Given Up is Known as: Ans : (d)
a) Production cost
b) Physical cost
c) Real cost
d) Opportunity cost

Q. 8 With Which of the Following is the Concept of Marginal Cost Closely Related? Ans : (a)
a) variable cost
b) fixed cost
c) opportunity cost
d) economic cost

SPM PRACTICAL CONCEPTS
CHAPTER 3

SPM CMA FINAL — QUICK FORMULAS — CHAPTER-3

1) $TC = TFC + TVC$
2) $AC = TC/Q$
3) $MC = \frac{\Delta TC}{\Delta Q}$ OR $\frac{d(TC)}{dQ}$
4) $AFC = TFC/Q$
5) $AVC = TVC/Q$

$Q = x =$ Level of Output

$C = K + f(x)$

$AC = \frac{K}{x} + \frac{f(x)}{x}$

$AFC = \frac{K}{x}$

$AVC = \frac{f(x)}{x}$

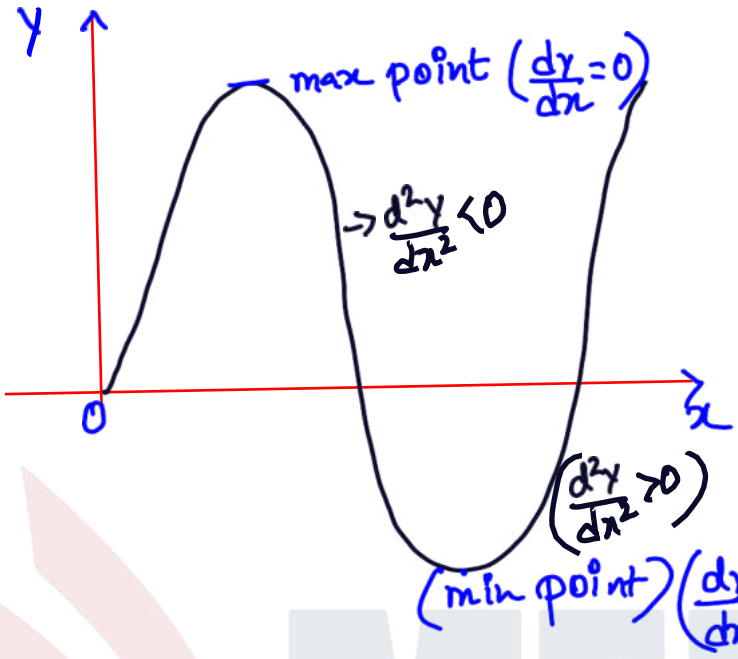
$MC = \frac{dC}{dx}$ or $f'(x)$

NOTES:→ for finding out Marginal always do the derivates of the Total Equations like:→

1) $MR = \frac{\Delta TR}{\Delta Q}$ OR $\frac{d\,TR}{dx}$
2) M.Profit = $\frac{d}{dx}$ (Marginal Profit)
3) $MC = \frac{dC}{dx}$

NOTES:→ for finding out averages always divide by output level like:→

1) $AC = TC/Q$ OR C/x
2) $AR = TR/Q$
3) Avg profit = Total Profit $/Q$



At max or min points slope = 0.

1) 1st order derivates is done to find out the maximum or minimum value of x.

2) 2nd order derivatives is done $\left(\frac{d}{dx}\text{ of }\left[\frac{dy}{dx}\right]\right)$ to check whether the equation (Y) is max or min so;

	MAXIMUM	MINIMUM
1)	$\frac{dy}{dx}=0$	$\frac{dy}{dx}=0$
2)	$\frac{d^2y}{dx^2}<0$	$\frac{d^2y}{dx^2}>0$

3) By doing $\frac{dy}{dx}=0$; we get value of x [max or min]

4) By doing $\frac{d^2y}{dx^2}$ we will find whether function is max or min.

5) Put value of x in the equation to get the max or min value of y.

FORMULA FOR DERIVATIVES

1) Derivative for a constant is always zero (0)

2) $\frac{d}{dx}(x^n) = nx^{n-1}$

• TR = P x Q

• Profit = TR - TC

In all the above computations we are taking x/Q as Quantity

Solve Sums :->

CHAPTER-3 PRACTICALS
SPM CMA FINAL

Q1. *The Cost Function Of A Particular Firm C = 1/3 x^3 – 5x² + 75x +10, Find At Which Level,*

i) The Marginal Cost Attains Its Minimum
ii) What Is The Marginal Cost Of This Level?

Q2. *The Cost Function 'C' For The Commodity 'Q' Is Given By C = q^3 – 4q² + 6q .*

Find Average Variable Cost And Also Find The Value Of Q For Which Average Variable Cost Is Minimum.

Q3. *The Cost Function 'C' Of A Firm = 1/3 x^3 – X² + 5x + 3,*

Find The Level At Which The Marginal Cost And The Average Variable Cost Attain Their Respective Minimum.

Q4. *Cost = 300x –10x² + 1/3 x^3, Calculate-*

(i) Output At Which Marginal Cost Is Minimum
(ii) (Ii) Output At Which Average Cost Is Minimum
(iii) (Iii) Output At Which Marginal Cost = Average Cost.

Q5. *The Revenue Function Of A Firm Given By R = (2200 – 3x) X 2 , Find The Firm's Marginal Revenue Function*

Q6. *Given C = x^3 – 10x² + 9x; R = 12x² + 11x – 4. Find The Total Profit And Hence Marginal Profits*

Q7. *The Demand Function For A Particular Commodity Is Y = 15 $e^{-x/5}$, Where 'Y' Is The Price Per Unit And 'X' Is The No. Of Units Demanded, Determine The Price And Quantity For Which Revenue Is Maximum*

Q8. *A Manufacturer Can Sell 'x' Items Per Month, At Price P = 300 – 2x. Manufacturer's Cost Of Production ` Y Of 'x' Items Is Given By Y = 2x + 1000. Find No. Of Items To Be Produced To Yield Maximum Profit Per Month*

Q9. *The Total Cost (C) And The Total Revenue (R) Of A Firm Are Given C (x) =* x^3 *+ 60x² + 8x; R(x) =* $3x^3$ *- 3x² + 656x, X Being Output Determine, The Output For Which The Firm Gets Maximum Profit. Also Obtain The Maximum Profit.*

Q10. *A Company Is Planning To Market A New Model Of A Doll. Rather Than Setting The Selling Price Of The Doll Based Only On Production Cost Estimation Management Polls The Retailers Of The Doll To See How Many Dolls They Will Buy For Various Prices.*

From This Survey, It Is Determined At The Unit Demand Function (The Relationship Between The Amount 'X' Each Retailer Would Buy And The Price He Would Pay) Is X = 30000 – 1500p.

The Fixed Cost Of The Production Of The Dolls Are Found To Be `28,000 And Cost Of Material & Labour To Produce Each Doll Is Estimated To Be ` 8 Per Unit.

What Price Should The Company Charge Retailer In Order To Obtain A Maximum Profit? Also Find The Maximum Profit.

Q11. *The Cost (C) Of A Firm Is Given By The Function C =*

$$4x^3 + 9x^2 + 11x + 27$$

Find The Average Cost, Marginal Cost, Average Variable Cost, And Average Fixed Cost 'X' Being The Output.

CHAPTER-3 PRACTICALS PART-2
SPM CMA FINAL

Q1. *The cost function of a firm is given by c = x3 - 4x² + 7x, find at what level of output Average Cost is minimum and what level will it be?*

Q2. *The Average Cost function (AC) for a certain commodity is given by AC = 2x – 1 + $\frac{50}{x}$ in terms of output x,*

Find the output for which

i) Average cost is increasing
ii) Average cost is decreasing
iii) Find the total cost
iv) Marginal Cost

Q3. *Cost Function C = $\frac{3}{5}x + \frac{15}{4}$,*

Find- (i) Cost when output is 5 units (ii) Average Cost of 10 units (iii) Marginal cost.

Q4. *A manufacturer can sell "x" items (x > 0) at a price of (330 – x) each;*

the cost of producing 'x' items is `x² + 10x + 12. How many items should he sell to make the maximum profit? Also determine the maximum profit

Q5. *The efficiency (E) of a small manufacturing concern depends on the number of workers (W) and is given by 10E = $\frac{-w3}{40}$ + 30W – 392, find the strength of the worker, which give maximum efficiency.*

Q6. *A firm assumes a cost function c(x) = x ($\frac{x2}{10}$ + 200), x is a monthly output in thousands of units. Its revenue function is given by R (x) = ($\frac{2200-3x}{2}$) x .*

Find –

i) If the firm decides to produce 10,000units per month, the firms cost and Marginal cost.

ii) If the firm decides to produce Marginal cost of 320, the level of output per month, and cost of the firm.

iii) The marginal revenue function.

iv) If a decision is taken to produce 10,000 units each month, the total revenue and marginal revenue of the firm.

v) If the firm produces with a marginal revenue of 1040, the firm's monthly output and monthly revenue.

vi) The firm's profit function and marginal profit function.

vii) The output required per month to make the marginal profit=0, and find the profit at this level of output.

viii) Find the marginal revenue and the marginal cost at the output obtained in

(vii) and comment upon the result

Q7. *A radio manufacturer produces 'x' sets per week at total cost of ` x^2 + 78x + 2500. He is a monopolist and the demand function for his product is x = $\frac{(600-P)}{8}$, when the price is 'p' per set show that maximum net revenue is obtained when 29 sets are produced per week what is the monopoly price*

Q8. *P = $\frac{150}{q2+2}$ - 4 represents the demand function for a product where 'p' is the price per unit per 'q' units;*

Determine the marginal revenue function.

Q9. *The price (P) per unit at which company can sell all that it produces is given by the function P(x) = 300 – 4x. The cost function is 500 + 28x, where 'x' is the number of units, find x, so that profit is maximum*

Q10. *If 'n' be the no. of workers employed the average cost of production is given by C = 24n* $+\frac{3}{2(n-4)}$.

Show that n = 4¼ will make C minimum.

Q11. *A firm has revenue function given by R = 8D, where R = Gross Revenue and D= Quantity sold, production cost function is given by C = 15000 + 60* $\left(\frac{D}{900}\right)^2$*. Find the total profit function and the number of units to be sold to get the maximum profit*

Q12. *The total cost function of a firm C =* $\frac{x3}{3}$ *– 5x² + 28x + 10, where C is total cost and 'x' is the output. A tax @`2 per unit of output is imposed and the producer adds it to his cost.*

If the demand function is given by P = 2530 - 5x, where `'P' is the price per unit of output, find the profit maximising output and the price at the level.

Q13. **Find the Elasticity of Demand for the following:**

(i) $P = \frac{10}{(x+2)^2}$

(ii) $P = \frac{10}{(x+2)^2}$

(iii) $x \cdot p^n = K$, where n, k are constant.

Q14. **The Demand curve for x is given by the equation P = 24 – ½** $\sqrt{q}$ **, where P and q denote price and quantity respectively. Find the point price elasticity for P = `20**

Q15. The Demand function is $x = 100 + 4p + 10p^2$, where x is demand for the commodity at price'p' compute marginal quantity demand, average quantity demand and hence elasticity of demand, at p = 4

Q16. Find an expression for price elasticity in the case of following demand functions and Evaluate it at the price P = 20

(i) $12Q + 7P = 216$

(ii) $Q = 2500 - 8P - 2P^2$

(iii) $Q = \frac{64}{p6}$

(iv) $Q = \frac{5p}{(1-3p)^2}$

Q17. The total revenue from sale of 'x' units is given by the equation $R = 100x - 2x^2$, calculate the point price elasticity of demand, when marginal revenue is 20.

Q18. Prove that the elasticity of demand for the following is constant $x = 3(p^{-2})$, Where P and X are the price & quantity demanded respectively.

Q19. The total cost (C) and the total revenue (R) of a firm are given C (x) = x3 + $60x^2$ + 8x; R(x) = $3x^3$- $3x^2$ + 656x, x being output determine, the output for which the firm gets maximum profit. Also obtain the maximum profit.

Q20. A monopolist has demand curve x = 106 – 2p and average cost curve (AC) = 5 + x/50.

The total revenue is (R) = xp, determine the most profitable output and maximum profit.

SPM CMA FINAL

PAST EXAM QUESTIONS

Q1. *The total cost function of a firm, $C = \frac{X^3}{3} - 5x^2 + 28x + 10$ where C is total cost and 'x' is the output. A GST @ Rs.2 per unit of output is imposed and the producer adds it to his cost. If the demand function is given by D = 2530 – 5x, where Rs. D is the price per unit of output.*

Find the profit maximizing output and the price at the level. Also obtain maximum profit.

(8+2=10)Marks

Q2. *The total cost function for a monopolist is given by $TC = 900 + 40Q^2$. The demand function for the goods produced by the monopolist is given by 2Q = 48 – 0.08P. What will be the profit maximizing price?*

8 Marks

Q3. *A departmental store of Mumbai conducted a study of the demand for men's ties. It found that the average daily demand (D) in terms of price (P) is given by the equation D = 120 – 5P.*

You are required to ascertain ----

i. *How many ties per day can the store expect to sell at a price of Rs. 20 per tie?*
ii. *If the store wants to sell 40 ties per day what price should it change?*
iii. *What is the highest price anyone would be willing to pay?*

(3+3+4=10) Marks

Q4. *A manufacturer can sell "X" items (X > 0) at a price of (330 – X) each; the cost of producing 'X' items is Rs. ($X^2 + 10X + 12$). How many items should he sell to make the maximum profit? Also determine the maximum profit?*

8 Marks

Q5. *The Cost Function of a particular firm is* $C = \left(\frac{1}{3}\right) x^3 - 5x^2 + 75x + 10$.

i. *Find at which level the Marginal Cost attains its minimum.*

ii. *What is the marginal cost at this level?*

SPM PRACTICALS PART-3

SPM CMA FINAL

Q1. *Assume that for a closed economy E = C + I + G; Where E= total expenditure on consumption goods, I = Exp. onInvestment goods and G = Govt. Spending. For equilibrium, we must have E = Y, Y being total income received.*

For a certain Economy, it is given that C = 15 + 0.9Y, where I = 20 + 0.05Y and G = 25. Find the equilibrium values ofY, C and I. How will these change, if there is no Government spending.

Q2. *A demand function of an item is P = 8/(x+1) – 2 and supply function is P = (x+3)/2, determine the equilibrium price and consumer's surplus.*

Q3. *The demand function for a particular brand of pocket calculator is stated below, $P = 75 - 0.3Q - 0.05Q^2$, Find theconsumer's surplus at a quantity of 15 calculators.*

Q4. *The demand and supply function under perfect competition are $Y = 16 - x^2$ and $Y = 2(x^2 + 2)$ respectively. Find the market price, consumer's surplus and producer's surplus.*

Q5. *The demand function is $Y = 85 - 4x - x^2$, 'y' is the price and 'x' is the quantity demand. Find the consumer's surplus for Y = 64.*

Q6. *Find whether the following commodities are complementary or competitive (or) substitutes, where P_1, P_2 and X_1 X_2 are prices and quantities respectively of the two commodities.*

i. $x_1 = P_1^{-1.7} . P_2^{0.8}$; $x_2 = P_1^{0.5} . P_2^{-2}$

ii. $x_1 = \frac{4x^3}{P_1^2 \ P_2}$; $x_2 = \frac{16}{P_1 \ P_2^2}$

iii. $x_1 = P_1^{-8} . P_2^{1.2}$; $x_2 = P_1^{0.2} . P_2^{0.6}$

iv. $x_1 = P_1^{-1.1} . P_2^{0.3}$; $x_2 = P_1^{0.2} . P_2^{0.6}$

v. $x_1 = 1 - 2P_1 + P_2$; $x_1 = 5 - 2P_1 - 3P_2$

vi. $x_1 = \frac{P_2^{0.6}}{P_1^{1.5}}$; $x_1 = \frac{P_1^{0.1}}{P_2^{0.1}}$

Q7. *K ltd. sells output in a perfectly competive market. The avarage variable cost function K Ltd is*

$AVC = 300 - 40Q + 2Q^2$

K ltd has an obligation to pay Rs. 500 irrespective of the output produced. What is the price below which K Ltd has to shut down its operation in the short run?

Q8. *J ltd is operating in a perfectly competative market. The price elastacity of demand and supply of the product estimated to be 3 and 2 respectively. The equlibrium price of the product is Rs. 100. If the government imposes a specific tax of Rs. 10 per unit, what will be the new equilbrium price?*

Q9. *The total cost function for a monopolist is given by TC = 900 + 40 Q^2. The demand function for the good produced by the monopolist is given by 2Q = 48 – 0.08 P. What will be the profit maximising price?*

Q10. *S Ltd. a monopolist aims at profit maximisation. The fixed cost of the firm is Rs. 200 and the average variable cost of the firm is constant at Rs. 30 per unit. S Ltd. sells goods in West Bengal and Kerala. The estimated demand functionfor the goods in west bengal and Kerala are:*

$P_w = 40 – 2.5\ Q_w$

$P_k = 120 – 10\ Q_k$

If price discrimination is practiced by S ltd., what will be the profit maximising output?

Q11. ***The total cost function of a monopolist is given by***

$$C = 50 + 40\ x + 40\ (x_1 + x_2)$$

The total demand is given by

$$P_1 = 80 - 2.5x_1$$

$$P_2 = 180 - 10x_2$$

If the price discrimination is practiced by the monopolist, what will be the equilibrium output in each segment and what will be the price?

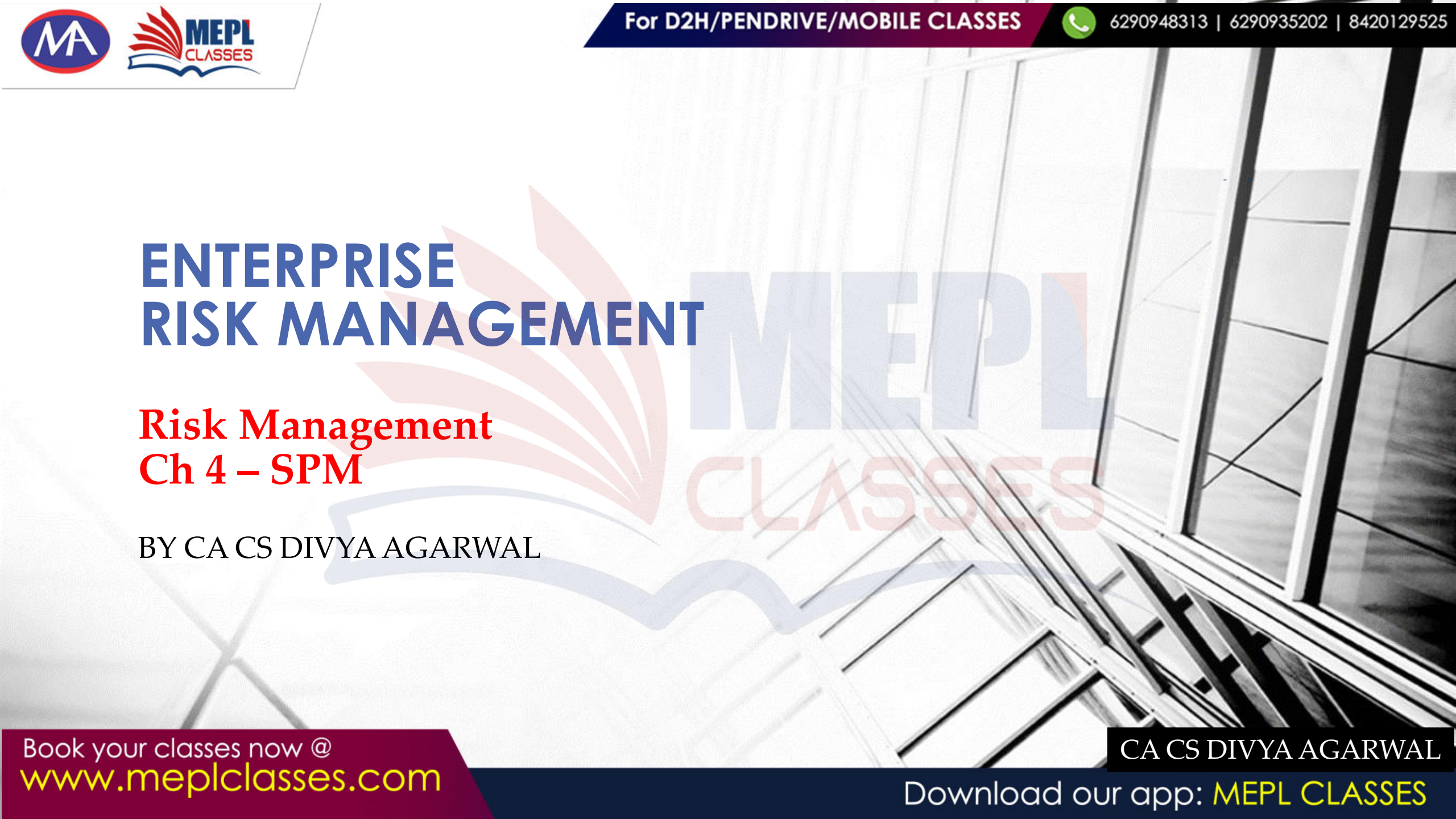
Prove that the market with the higher elasticity will have the lower price.

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ENTERPRISE RISK MANAGEMENT

Risk Management
Ch 4 – SPM

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Risk Management



(I) **According to Dowd (2005),**

- Risk refers to the chance of financial losses due to random changes in underlying risk factors

(II) **Risk is composed of three elements —**

- the scenario,
- its probability of occurrence, and
- the size of its impact if it did occur (either a fixed value or a distribution).

Risk is thus measured by volatility.

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Risk Management



RISK MANAGEMENT STRATEGY

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- ✓ Risk Minimization
- ✓ Risk Sharing
- ✓ Risk Bearing

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TYPES OF RISK



- Country Risk
- Economic Risk
- Social Risk
- External Risk
- Exchange Risk
- Business Risk
- Finance Risk
- Systematic Risk
- Unsystematic Risk
- Market Risk
- Interest Rate Risk
- Purchasing Power Risk
- Default Risk
- Callability Risk
- Convertibility Risk
- Industry Risk
- Currency Risk
- Operational Risk

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POLITICAL RISK





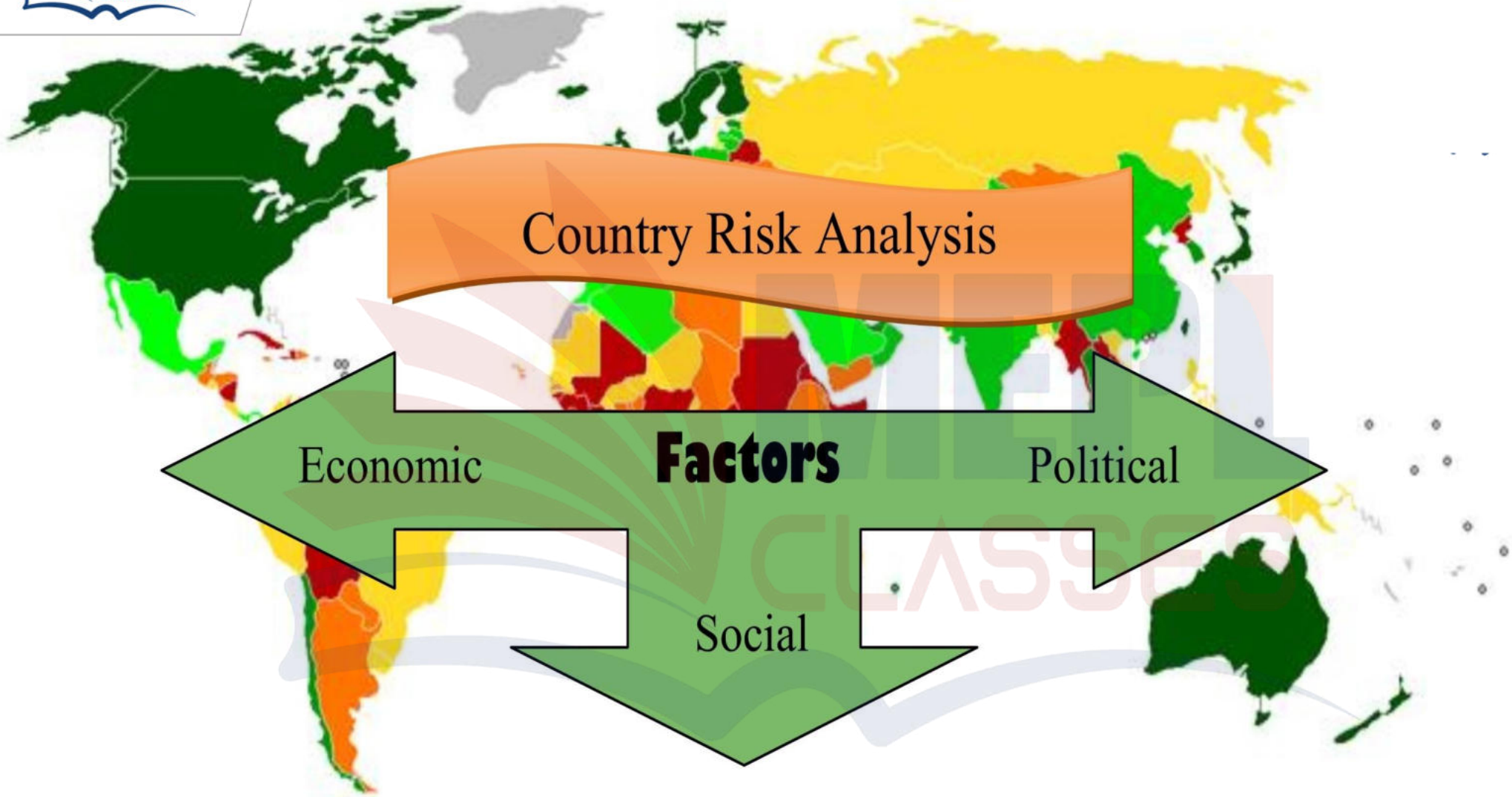






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ECONOMIC RISK

Economic risk is concerned with the general economic climate within the country.



a) Level of affluence enjoyed by the country
b) the growth rate of income.
c) the nation's propensity to save/invest.
d) the stability of prices (inflation).
e) characteristics of the labour force.
f) level of sophistication of the financial system.
g) level of foreign debt outstanding.
h) major income earners (exports) and their sensitivity to overall global economic changes.
i) extent of dependence on major export items.
j) trends in balance of payments.
k) level of imports
l) level of reserve and credit standing, and
m) fluctuations of exchange rate and controls on foreign exchange

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Social risk refers to the possibilities of loss due to factors such as religious fanaticism, ethnic polarization, dissatisfaction among the people as a result of wide disparity in income distribution, or regionalism

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EXTERNAL RISK

The external risk component of country risk arises due to situations outside the country



INDIA VS PAKISTAN



ISRAEL VS PALESTINE (GAZA STRIP)



SYRIA CONFLICT

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EXCHANGE RISK

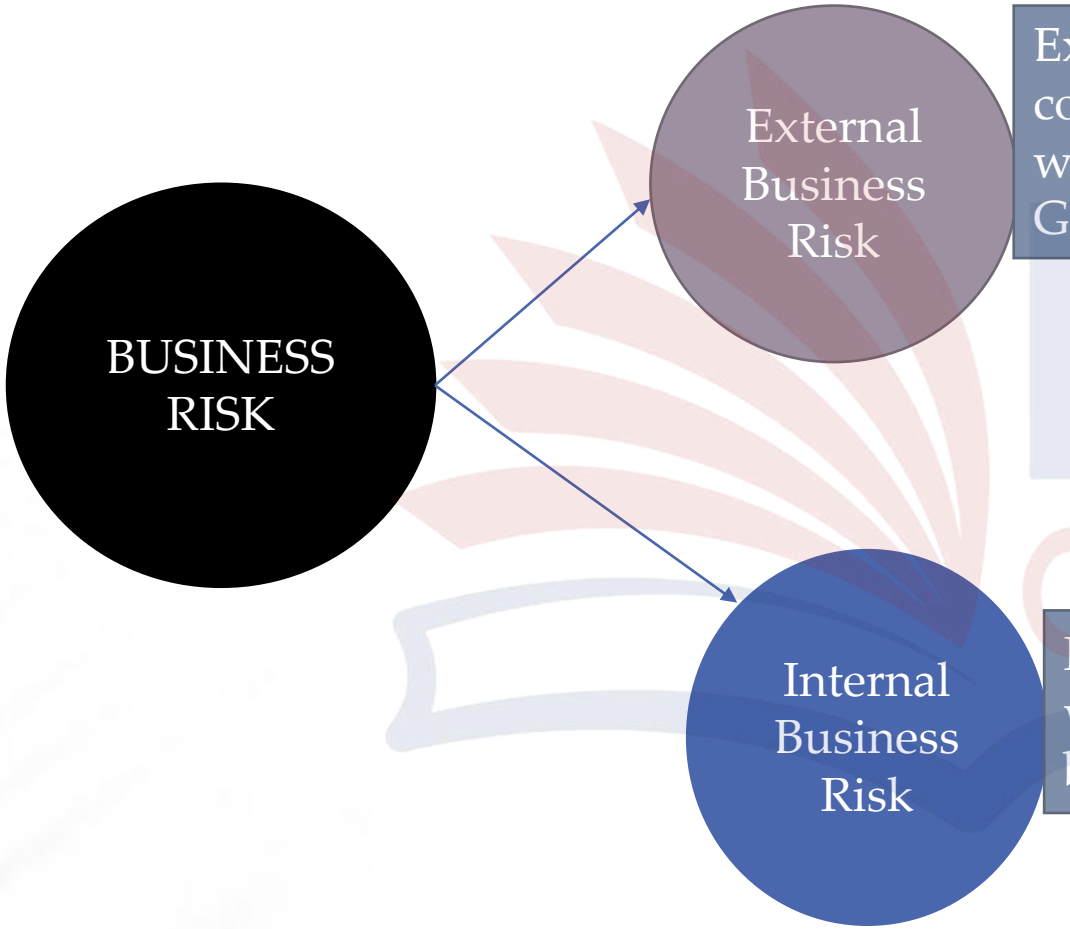




DEPENDS UPON THE ECHANGE RATES BETWEEN TWO CURRENCY WHICH KEEPS ON FLUCTUATING DEPENDING UPON VARIOUS CIRCUMSTANCES

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BUSINESS RISK



External business risk arises due to change in operating conditions caused by conditions thrust upon the firm which are beyond its control - such as business cycles, Governmental controls etc.

Internal business risk is associated with the efficiency with which a firm conducts its operations within the broader environment imposed upon it

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BUSINESS RISK



1. Production (weather, disease/pests, field loss, spoilage)
2. Price/Market (reduced premiums, high input prices, etc.)
3. Casualty (fire, weather and theft)
4. Technology (performance failure, obsolete machinery)
5. Relationship (landlord, lender, supplier and buyer)
6. Legal/Regulatory (non-compliance with regulations contract rules or other laws)
7. Human (underperforming managers, injured employees)

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FINANCIAL RISK

1. Debt use and leverage
2. Interest rates (fixed or variable)
3. Capital lease commitments
4. Working capital and liquidity
5. Incomplete budgeting or investment analysis

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Total Risk = Systematic Risk + Unsystematic Risk

Total Risk = Systematic Risk + Unsystematic Risk

Systematic Risk is the variability of return on stocks or portfolios associated with changes in return on the market as a whole.

Unsystematic Risk is the variability of return on stocks or portfolios not explained by general market movements. It is avoidable through diversification.

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SYSTEMATIC RISK

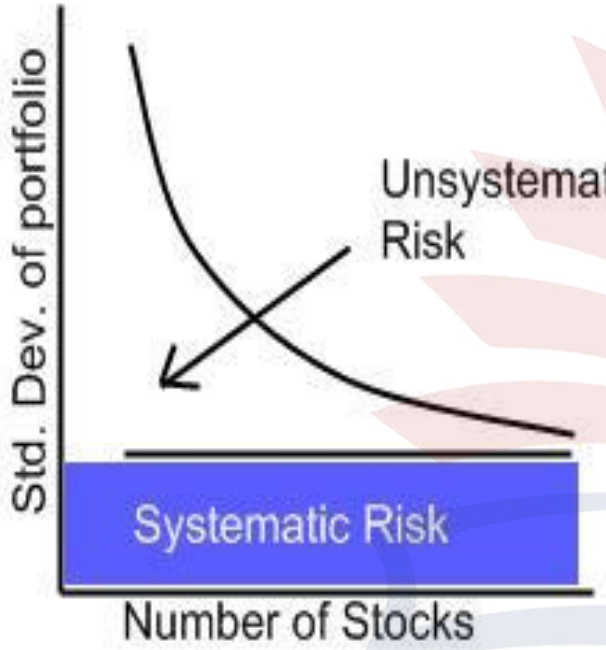
- Systematic Risk is also referred to as non-diversified risk or market risk. Systematic risk is the fluctuation in the return on securities that occur due to macroeconomics factors. These factors could be the potential, social or economic factors that affect the business.

UNSYSTEMATIC RISK

- The fluctuation in return of a company arising due to micro-economics factors are referred as unsystematic risks. These risk factors exist within the company and can be avoided if necessary actions is taken. The risk factors can include the production of undesirable products, labour strikes, etc.

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SYSTEMATIC RISK

- **Market Risk**
- **Interest Rate Risk**
- **Purchasing Power Risk**

UNSYSTEMATIC RISK

- **Business Risk –** Internal Risk, External Risk
- **Financial Risk –** Default Risk, Currency Risk, Liquidity Risk, Country Risk, Liquidity Risk

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Market Risk



VARIATION IN PRICE DUE TO REAL SOCIAL, ECONOMICAL & POLITICAL EVENTS

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INTEREST RATE RISK



The cost of corporate debt depends :-
- interest rates prevailing,
- maturity periods,
- creditworthiness of the borrowers,
- monetary and credit policy of the central bank, riskiness of the investments,
- expectations of the investors etc

The uncertainty of future market values and the size of future incomes, caused by fluctuations in the general level of interest are known as 'interest rate risk'

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INTEREST RATE RISK



Price of Security/ bond

IRR

Rate of Interest

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PURCHASING POWER RISK



Uncertainties of purchasing power is referred to as risk due to inflation.

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DEFAULT RISK



The default risk arises due to the default in meeting the financial obligations as and when due for payment.

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LIQUIDITY RISK



Liquidity Risk means Cash Crunch for a temporary or short term period and such situation generally have adverse effect on any Business and Profit making organisation

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CALLABILITY RISK

is the risk thCall risk at a callable bond will be "called." The risk relates to a bond being called before maturity. Callable bonds are akin to call options, where the issuer has the right to call the bond before maturity.



1) It is that portion of security's total variability of returns that derives from the possibility that the issue may be called or redeemed before maturity.
2) Callability risk commands a risk premium that comes in the form of a slightly higher average rate of return.
3) This additional return should increase as the risk increases

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CONVERTIBLITY RISK



It is that portion of the total variability of return from a convertible bond or a convertible preferred stock that reflects the possibility that the investment may be converted into the issuer's common stock at a time or under terms harmful to the investor's best interests.

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INDUSTRY RISK



It is that portion of an investment's total variability of return caused by events that affect the products and firms that make upon industry, the stage of the industry's life cycle, international tariffs and/or quotas on the product produced by an industry.

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CURRENCY RISK

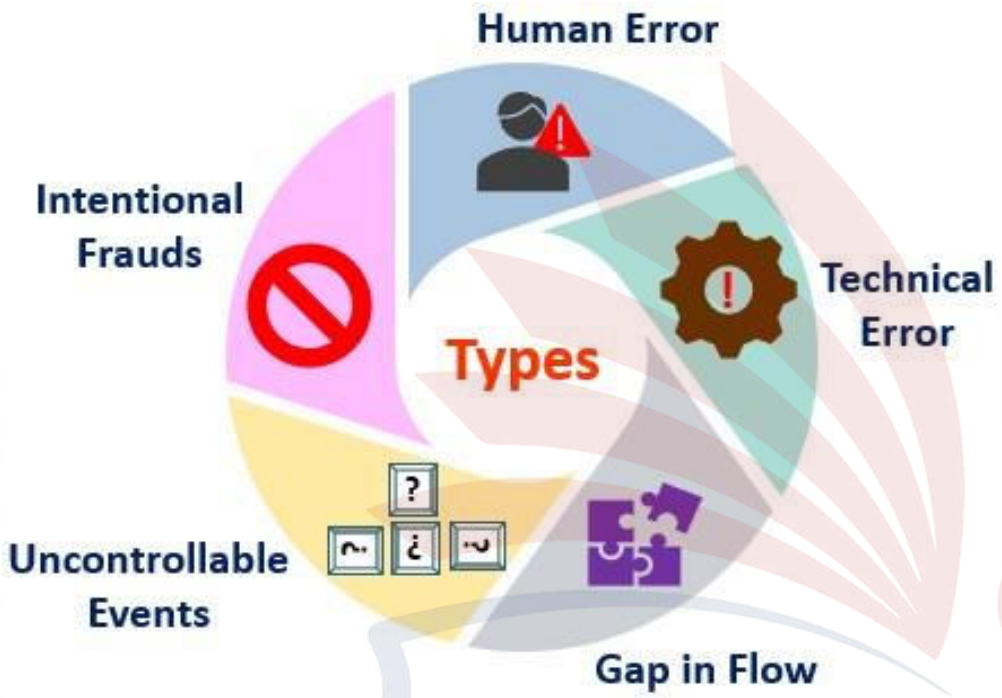


These risks involve the international payment of cash.

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OPERATIONAL RISK



1) Deviation from planned normal functioning of system, procedures, technology, human failure, omission or commission of errors.
2) Inherent fault in the systems, procedures and technologies that affect the revenue of the organization adversely.

As the activities of the organization change due to globalization and integration, new factors are continuously influencing and increasing the operational risk.

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RISK MANAGEMENT

- A systematic approach in identifying, analyzing and controlling areas or events with a potential for causing unwanted change
- Risk management is the act or practice of controlling risk
- Includes risk planning, assessing risk areas, developing risk handling options, monitoring risks to determine how risks have changed and documenting overall risk management program
- Risk Management process needs to identify measure and manage various risks so that comparison of risks and returns is possible to set corporate strategies
- Risk Management is the identification and evaluation of risks to an organization including risks to its existence, profits and reputation (solvency) and the acceptance, elimination, controlling or mitigation of the risks and the effects of the risks

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RISK MANAGEMENT

- Integrated risk management is a continuous, proactive and systematic process to understand, manage and communicate risk from an organization-wide perspective. It is about making strategic decisions that contribute to the achievement of an organization's overall corporate objectives.
- Risk management is first and foremost a 'science' and then an 'art'. Given the appetite for risk, if one uses accurate and relevant data, reliable financial models and best analytical tools, one can minimize risk and make the odds work in one's favour
- According to Deventer, Imai & Mesler (2005), it is the discipline which makes us appreciate the risks and returns from various portfolio and transaction-level strategies.

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Objectives of Risk Management

a) Anticipating the uncertainty and the degree of uncertainty of the events not happening the way they are planned.

b) Channelizing events to happen the way they are planned

c) Setting right, at the earliest opportunity, deviations from plans, whenever they occur.

d) Ensuring that the objective of the planned event is achieved by alternative means, when the means chosen proves wrong, and

e) In case the expected event is frustrated, making the damage minimal.

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CHAPTER 4 Practicals

Q1.

From the information given below relating to Bad Past Ltd., calculate Altman's Z-score and comment:

$$\left(\frac{\text{Working capital}}{\text{Total assets}}\right) = 25\%$$

$$\left(\frac{\text{Re tained earnings}}{\text{Total assets}}\right) = 30\%$$

$$\left(\frac{\text{Earnings before int erest \& taxes}}{\text{Total assets}}\right) = 15\%$$

$$\left(\frac{\text{Market value of equity}}{\text{Book value of total debt}}\right) = 150\%$$

$$\left(\frac{\text{Sales}}{\text{Total assets}}\right) = 2 \text{ times}$$

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Q2.

From the information given below relating to Unfortunate Ltd., calculate Altman's Z-score and comment:

$$\left(\frac{\text{Working capital}}{\text{Total assets}}\right) = 0.45$$

$$\left(\frac{\text{Re tained earnings}}{\text{Total assets}}\right) = 0.25$$

$$\left(\frac{\text{Earnings before int erest \& taxes}}{\text{Total assets}}\right) = 0.30$$

$$\left(\frac{\text{Market value of equity}}{\text{Book value of total debt}}\right) = 2.50$$

$$\left(\frac{\text{Sales}}{\text{Total Assets}}\right) = 3 \text{ times}$$

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Q 3.

Using Altman's Multiple Discriminant Function, calculate Z-score of S & Co. Ltd., where the five accounting ratios are as follows and comment about its financial position:

Working Capital to Total Assets=0.250

Retained Earnings to Total Assets = 50%

EBIT to Total Assets = 19%

Book Value of Equity to Book Value of Total Debt= 1.65

Sales to Total Assets = 3 times

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Q4.

From the information provided relating to a company, calculate Altman's Z-score and comment on the financial condition of the company:

Particulars	`
Equity Share Capital (of ` 10 each)	2,00,000
12% Preference Share Capital (of ` 100 each)	1,00,000
Fixed Assets	3,00,000
Current Assets	2,00,000
Fictitious Assets	25,000
Current Liabilities	1,00,000
10% Debentures	2,00,000
General Reserve	75,000
Profit & Loss A/c (Cr.)	50,000
Sales	10,00,000
Earnings before Tax	1,30,000
Interest on Debentures	20,000
Market Value of each Equity Share	15
Market Value of each Preference Share	150

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Q5.

Using Altman's Model, compute the value of Z from the provided data (Balance Sheet extract):

Liabilities	`	Assets	`
Share Capital (@ `10 each)	2,00,000	Fixed Assets	4,20,000
Reserves & Surplus	60,000	Inventory	1,80,000
10% Debentures	3,00,000	Book Debts	70,000
Sundry Creditors	80,000	Loans & Advances	20,000
Outstanding Expenses	60,000	Cash at Bank	10,000
	7,00,000		7,00,000

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Q6.

Following is the extract of a Balance Sheet of a company as on 31 March, 2014:

Liabilities	`	Assets	`
Equity Share Capital (` 100)	4,00,000	Fixed Assets	10,00,000
Reserves & Surplus	2,25,000	Trade Investment	2,00,000
12% Debentures	3,00,000	Stock	1,25,000
10% Bank Loan	2,00,000	Debtors	75,000
Current Liabilities	3,00,000	Preliminary Expenses	25,000
	14,25,000		14,25,000

Additional Information

(i) Net sales for 2013-14 were ` 20,00,000.

(ii) Price-Earnings Ratio is ` 10.

(iii) Dividend Pay-out Ratio is 50%.

(iv) Dividend per Share in 2013-14 is ` 20.

(v) Corporate Tax Rate is 50%.

Using Altman's Model, calculate the Z-score of the company and interpret the result.

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Q7.

Balance Sheet (extract) of Q Ltd. as on 31 March 2014.

Liabilities	` in Crores	Assets	` in Crores
Equity Shares	20.80	Fixed Assets	105.60
Long-term Liabilities Current	104.00	Current Assets	57.60
Liabilities	78.40	Profit & Loss A/c	40.00
	203.20		203.20

Additional Information:

(i) Depreciation written off ` 8 crores.

(ii) Preliminary Expenses written off ` 1.60 crores.

(iii)Net Loss ` 25.60 crores.

Ascertain the stage of sickness.

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Q8. THE FOLLOWING FINANCIAL DATA RELATED TO THE BALANCE SHEET OF VEDISHA LTD, A PUBLIC LISTED LARGE MANUFACTURING COMPANY AS AT MARCH 31ST , 2019, HAS BEEN EXTRACTED FROM THE ANNUAL REPORT 2018-19:

ASSETS	AMOUNT IN LAKHS
NON CURRENT ASSETS:	
(A) PROPERTY, PLANT, EQUIPMENT	1,620
(B) OTHER ASSETS	140
TOTAL NON – CURRENT ASSETS	1,760
CURRENT ASSETS	
(a) INVENTORIES	305
(b) FINANCIAL ASSETS	
(i) INVESTMENT	250
(ii) TRADE RECEIVABLES	245
(iii) CASH AND CASH EQUIVALENTS	125
(c) OTHER ASSETS	80
TOTAL CURRENT ASSSETS	1,005
TOTAL ASSETS	2,765
1. EQUITY AND LIABILITIES	
SHAREHOLDERS FUND:	
A) EQUITY SHARE CAPITAL (RS.10 EACH)	500
B) RESERVE AND SURPLUS	1,250
TOTAL EQUITY	1,750
2. NON-CURRENT LIABILITIES	
A) FINANCIAL LIABILITIES- BORROWINGS	600
B) PROVISIONS	10
C) OTHER LIABILITIES	80
TOTAL NON-CURRENT LIABILITIES	690
3. CURRENT LIABLITIES	
A) FINANCIAL LIABILITIES	
(i) BORROWINGS	--
(ii) TRADE PAYABLE	195
B) PROVISIONS	10
C) OTHER LIABILITIES	120
TOTAL CURRENT LIABILITIES	325
TOTAL EQUITY AND LIABILITIES	2,765

Additional Information:

(I) Net Sales For 2018-19 Were Rs. 3,050 Lakh.

(Ii) Operating Profit Of The Company For The Year Was Rs. 585 Lakh.

(Iii) Market Value Of Each Equity Share Is Rs.16 On The Stock

Exchange.

Using The Above Information Provided And Discriminant Function Developed By Altman, You Are Required To Calculate Z-Score Of Vedisha Ltd. And Comment On The Financial Condition Of The Company.

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Q9. THE FOLLOWING FINANCIAL DATA RELATED TO BALANCE SHEET OF XYZ LIMITED FOR FY 2017-18 HAS BEEN EXTRACTED FROM THE ANNUAL REPORT 2017-18:

BALANCE SHEET OF XYZ LIMITED AS AT MARCH 31

ASSETS	(RS. IN CRORE)
NON CURRENT ASSETS	
A) PROPERTY PLANT EQUIPMENT	70,492.90
B) CAPITAL WORK IN PROGRESS	5,641.50
C) INTANGIBLE ASSETS	786.18
D) FINANCIAL ASSETS	-
E) OTHER ASSETS	2,140.84
TOTAL NON-CURRENT ASSETS	79,511.42
CURRENT ASSETS	
A) INVENTORIES	11,023.41
B) FIANCIAL ASSETS	
(i) INVESTMENTS	14,640.37
(ii) TRADE RECEIVABLES	1875.63
(iii) CASH AND CASH EQUIVALENTS	4588.89
(iv) OTHER FINANCIAL ASSETS	480.62
C) OTHER ASSETS	1822.94
TOTAL CURRENT ASSETS	34,431.86
TOTAL ASSETS	1,13,943.28
EQUITY AND LIABILITIES	
EQUITY	
A) EQUITY SHARE CAPITAL	1,146.12
B) OTHER EQUITY	60,976.14
TOTAL EQUITY	62,122,26
NON-CURRENT LIABILITIES	
A) FINANCIAL LIABILITIES	
i) BORROWINGS	24,568.95
ii) OTHER FINANCIAL LIABILTIES	19.78
B) PROVISIONS	19,61.21
C) OTHER LIABILTIES	224.71
TOTAL NON-CURRENT LIABILITIES	26,774.65
CURRENT LIABILITIES	
A) FINANCIAL LIABILITIES	
i) BORROWINGS	669.88
ii) TRADE PAYABLES	11,242.75
iii) OTHER FINANCIAL LIABILITES	6541.40
B) PROVISIONS	735.28
C) OTHER LIABILITIES	5,857.06
TOTAL CURRENT LIABILTIES	25,046.37
TOTAL EQUITY AND LIABILITIES	1,13,943.28

Additional Information:

- Market Price of XYZ Limited share having a face value of 10 as on the Balance Sheet date was Rs.870.
- Operating Profit of the Company for the year was- RS. 21,640 crores.
- Operating Profit Margin of the Company is 16-25%.

Using the above information and Altman's Multiple Discriminant Function, you are required to calculate Z-score of XYZ Limited as per the revised Z-Score Model of Altman (1983) and comment on the financial position of the Company

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Q.10 (a) The Cost Function of a particular firm is $C = \left(\frac{1}{3}\right)x^3 - 5x^2 + 75x + 10$.

(i) Find at which level the Marginal Cost attains its minimum.

(ii) What is the marginal cost at this level? 4+4=8

(b) Following is the extract of a Balance Sheet of a company as on 31st March, 2017:

Liabilities	₹	*Assets*	₹
Equity Share Capital (₹ 100)	4,00,000	Fixed Assets	10,00,000
Reserves & Surplus	2,25,000	Trade Investment	2,00,000
12% Debentures	3,00,000	Stock	1,25,000
10% Bank Loan	2,00,000	Debtors	75,000
Current Liabilities	3,00,000	Preliminary Expenses	25,000
	14,25,000		14,25,000

Additional Information:

(i) Net Sales for 2016-17 were ₹ 20,00,000

(ii) Price-Earnings Ratio is ₹ 10

(iii) Dividend Pay-out Ratio is 50%

(iv) Dividend per Share in 2016-17 is ₹ 20

(v) Corporate Tax Rate is 50%

Using Altman's Model of Corporate Distress Prediction, calculate the Z-Score of the company and interpret the result. 12

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Q11 (i) What do you understand by corporate distress? List down important factors causing corporate distress. 4

(ii) The following financial information has been taken from the Annual Report 2019 of Stress Limited.

Balance Sheet of Stress Limited as at March 31,	2019
ASSETS:	(₹ in crores)
Non-Current Assets	
Property, Plant and Equipment	1,654.11
Intangible Assets	375.15
Other Non-Current Assets	388.18
	2,417.44
Current Assets	
Inventories	128.56
Financial Assets excluding Cash and Cash Equivalent	85.36
Cash and Cash Equivalent	6.85
Other Current Assets	568.93
Total Current Assets	**789.70**
Total Assets	**3,207.14**
EQUITY AND LIABILITIES:	
Equity	
Equity Share Capital	362.75
Other Equity	(568.94)
Net Worth	**(206.19)**
Non-Current Liability	
Financial Liabilities	1,203.00
Provisions	112.63
Other Non-Current Liabilities	46.59
Total Non-Current Liabilities	**1,362.22**
Current Liabilities	
Financial Liabilities	1,721.65
Provisions	95.25
Other Current Liabilities	234.21
Total Current Liabilities	**2,051.11**
Total Equity and Liabilities	**3,207.14**

Additional Information:

- Depreciation written off — ₹ 28 crores.
- Preliminary Expenses written off — ₹ 11.60 crores.
- Net Loss during the FY 2018-19 — ₹ 58.70 crores.

Using the NCAER Model for Corporate Distress Prediction, you are required to ascertain the stage of sickness. 6

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CHAPTER – 4

Enterprise Risk Management.

Risk → chance of financial loss which can occur if those underlying risk conditions crystalizes.

Dowd 2005.

RISK MANAGEMENT:-

1) Scenario. 2) probability of occurance.
3) impact / of the risk.

→ Probable loss

Future	
20-1 ✓	20 lacs ✓

Risk Measurement ⇒ Px (loss)

Value of Risk = 0.2 x 20 lacs
⇒ 4 lacs ✓

1) Identify.
2) Risk Ranking
3) Risk Analysis
4) Risk Measurement
5) Risk Mgmt Policies
6) Monitoring.

1) Risk Avoidance ✓
2) Risk Minimizatim ✓
3) Risk sharing / Pooling ✓

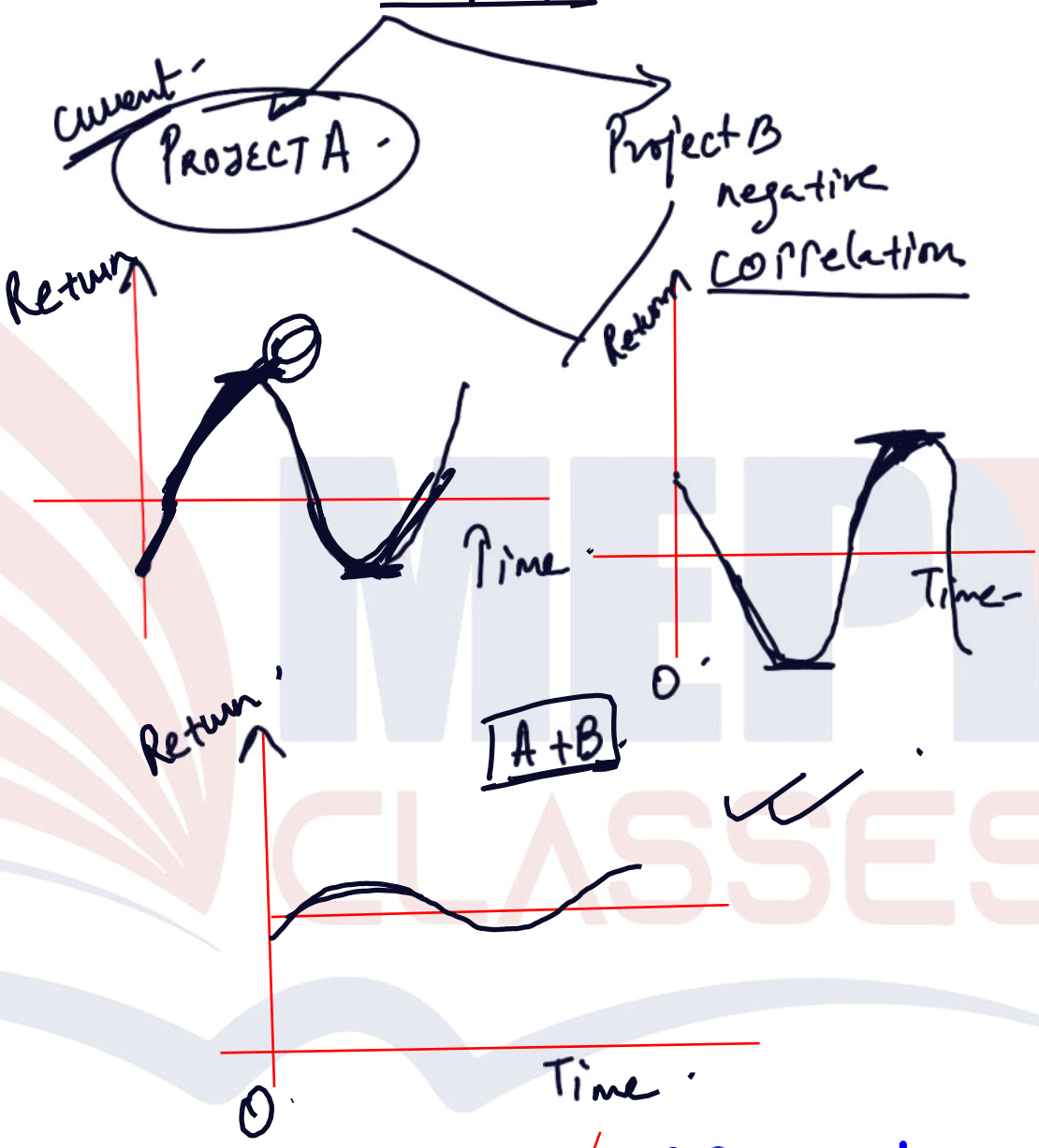
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4) Risk Acceptance

Risk Diversify

Company



Risk Pooling / Risk sharing

Corporate failure refers to companies ceasing operations following its inability to make profit or bring enough revenue to cover its expenses.

Symptoms
- LOW PROFITABILITY.
- HIGH GEARING.
- LOW LIQUIDITY.

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MODELS TO PREDICT CORPORATE FAILURE

33 Failed ; 33 Non Failed
22 Acc Rat; 22 Non Acc Ratios.

Altman Z-Score
- 1968 · Public Comp

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$$

$X_1 = \frac{W.C}{Total\ Assets}$

$X_2 = \frac{Retained\ Earnings}{Total\ Assets}$

$X_3 = \frac{EBIT}{Total\ Assets}$

$X_4 = \frac{M.V.\ of\ Equity\ \&\ Pref}{B.V.\ of\ Total\ Debt}$

$X_5 = \frac{Sales}{Total\ Assets}$

Z = Overall Index

Altman Z-Score
- 1983 [for Privately held firms]

$$Z = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5$$

$X_1 = \frac{B.V.\ of\ Equity}{Total\ Liabilities}$

X_2 = DO

X_3 = DO

X_4 = DO

X_5 = DO

Z = DO

NCAER MODEL

X_1 = DO (i) Cash Profit.

X_2 = DO (ii) Net W/C.

X_3 = DO (iii) Net worth.

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$Z > 2.99 \rightarrow$ Non failed
$Z < 1.81 \rightarrow$ failed
$Z \geq 1.81 \leq 2.99 \rightarrow$ GREY AREA.

$Z > 2.9$
$Z < 1.23$
$Z > 1.23 < 2.9$

1 -ve → (tendency to become sick)
2 -ve → (incipient sickness)
3 -ve → (fully sick)

EXTRA NOTES :-

(1) TOTAL ASSETS = fixed Assets + Current Assets. [Don't include fictitious assets]

(2) RETAINED EARNINGS = R/s + P/L(Cr.) − fictitious Asset.

(3) TOTAL DEBTS = LONG TERM DEBTS + CURRENT LIABILITIES.

(4) WORKING CAPITAL = Current Asset − Current Liab.

(5) CURRENT ASSETS = Stock + debtors + Cash/BK. (Don't include trade Inv.)

(6) CURRENT LIABILITIES = Creditors + O/s Expenses

(7) DIVIDEND PAYOUT RATIO = DPS/EPS.

(8) P/E RATIO = MPS/EPS

(9) Z-Score for manufacturers, industrials, non manufactures & emerging markets :→

$$Z = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

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X_1 = WC/Total Assets, X_2 = R.E/T.A,
X_3 = Earnings/T.A.; X_4 = B.V. of Equity/Total Liab.

$Z > 2.60$ — Safe zone.

$1.1 < Z < 2.60$ — Grey Zone

$Z < 1.1$ — Distress Zone.

CAUSES OF CORPORATE DISTRESS

- Technological Causes
- Working Capital Problems
- Over Expansion
- Poorly Structured Board
- Economic Distress
- Mismanagement
- Fraud by Mgmt
- Financial Distress.

CAUSES OF SICKNESS FOR A PROJECT.

INTERNAL

EXTERNAL.

Areas in which these causes exists are!

1) Project formulation (ill conceived projects, haste, external factors)
2) Project Implementation [Promoter's delay, delay in Adverse forex Rates, Power, water, Rethinking, Overspending]
3) Production [inc in COP, dec in Qty, Qlty↓ or stock accumulation].
4) Marketing.
5) finance
6) General & Personnel administration.

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FOR NCAER MODEL :-

(i) Cash profit = Net profit + Non cash Expenses
− Non Cash Income.

(ii) Net W.C = C.A. − C.L.

(iii) Net Worth = (Share Capital + R&S − Mis Exp − P/L Dr.)

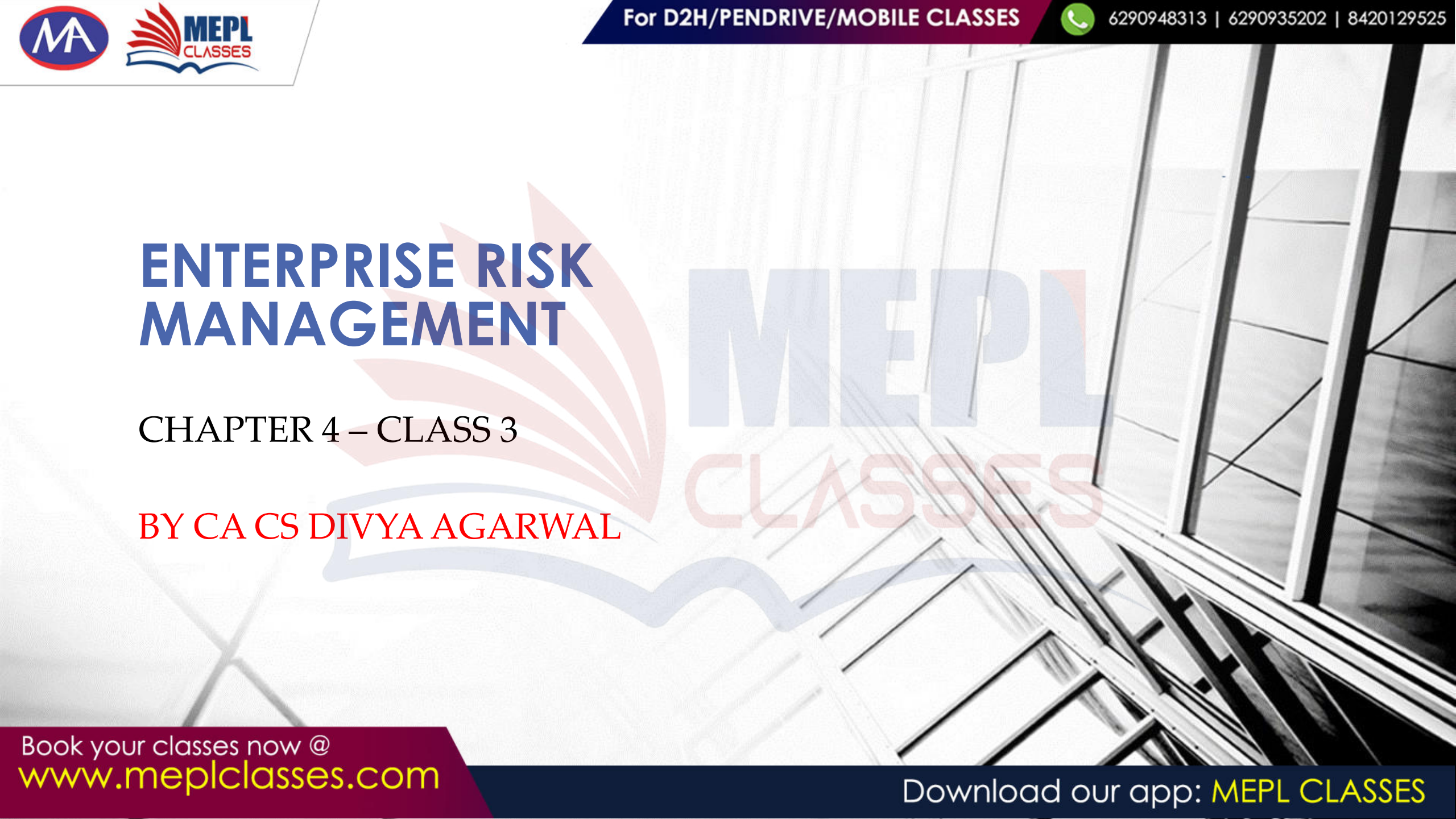
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ENTERPRISE RISK MANAGEMENT

CHAPTER 4 – CLASS 3

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PROBABILITY OF RUIN (RISK OF RUIN)

- **Risk of ruin** is the **probability** of an individual losing substantial amounts of money through investing, trading or gambling, to the point where it is no longer possible to recover the losses or continue
- Two method of computation –
  - Poison Process
  - GARBUR and SHIU Penalty Function

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RISK ANALYSIS –

- Risk analysis is a procedure to identify threats & vulnerabilities, analyze them to ascertain the exposures, and highlight how the impact can be eliminated or reduced.

- Risk analysis can be done with these two methods –
  - Risk Mapping
  - Key Risk Indicators

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RISK MAPPING

- Risk mapping is the process of –
  - **identifying,**
  - **quantifying and**
  - **prioritizing**

  the risks that may interfere with the achievement of your organizational objectives.

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RISK MAPPING

Identify all potential risk to which a company is exposed by techniques such as process mapping etc

- Risk mapping is the process of –
  - **identifying,**
  - **quantifying and**
  - **prioritizing**

  the risks that may interfere with the achievement of your organizational objectives.

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RISK MAPPING

Quantify the potential risk by determining the impact on the company/ process

- Risk mapping is the process of –
  - **identifying,**
  - **Quantifying, and**
  - **prioritizing**

  the risks that may interfere with the achievement of your organizational objectives.

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RISK MAPPING

- Risk mapping is the process of –
  - **identifying,**
  - **Quantifying, and**
  - **prioritizing**

  the risks that may interfere with the achievement of your organizational objectives.

Prioritize various risk with the help of the RISK MAP using tools such as Zurich IC^2 Profiler

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RISK MAP ??

A risk map is a graphical depiction of a select number of a company's risks designed to

(1) illustrate the impact or significance of risk on one axis, and

(2) the likelihood or frequency on the other axis.

The "stepped" line is the **Critical Issue Tolerance Boundary**

Zurich IC² Profiler



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OPERATIONAL RISK – ZURICH IC^2 PROFILER

Operational risks are classified in Zurich IC2 as

1) **People risk** (human errors, accidents & personal injuries, frauds, etc)
2) **Process risk** (faulty business process, incorrect working method, etc)
3) **Relationship risk** (loopholes in contracts rousing disputes/ damages, statutory violations entailing penalties, etc)
4) **Technology risk** (obsolete plant, unreliable machineries, software bugs/ virus, etc)
5) **External risk** (disaster, riots, wars, etc).

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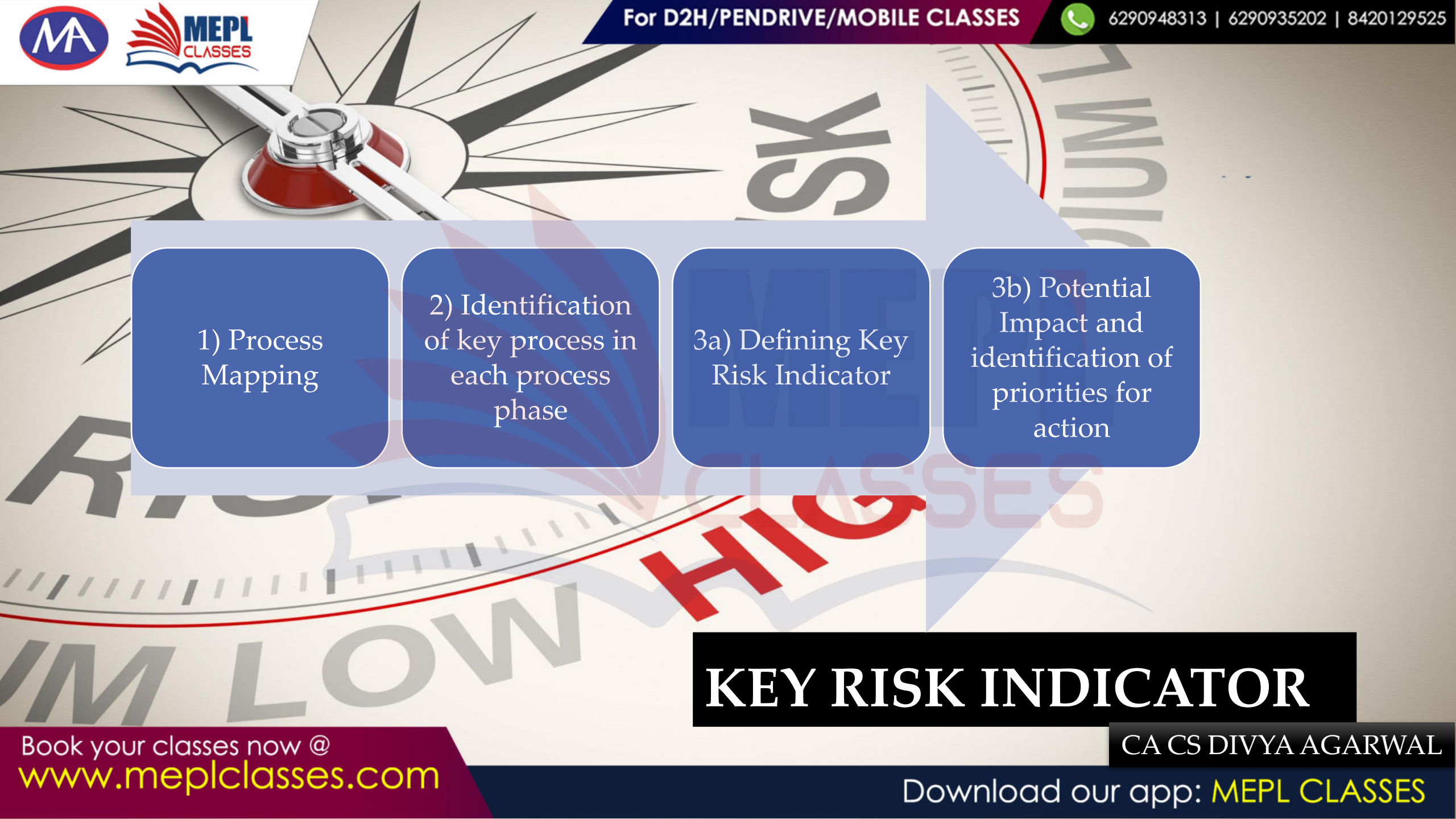
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Benefits of Risk Mapping

- ✓ **Promotes awareness of significant risks** through priority ranking, facilitating the efficient planning of resources.
- ✓ Enables the **delivery of solutions and services** across the entire risk management value chain.
- ✓ Serves as a powerful aid to **strategic business planning**.
- ✓ Aids the development of an action plan for the **effective management of significant risks**.
- ✓ Assigns clear responsibilities to individuals for the **management of particular risk areas**.
- ✓ Provides an opportunity to **leverage risk management as a competitive advantage.**
- ✓ Facilitates the **development of a strategic approach** to insurance programme design.
- ✓ Supports the **design of the client's risk financing and insurance programs,** through the development of effective/optimal retention levels and scope of coverage etc

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1) Process Mapping

2) Identification of key process in each process phase

3a) Defining Key Risk Indicator

3b) Potential Impact and identification of priorities for action

KEY RISK INDICATOR

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THE ACTION PLAN TO IDENTIFY KEY RISK INDICATORS -

1) The definition of the operational events that should be captured by the data base.
2) The minimum threshold of loss to be recorded
3) The classification criteria that should be applied to operational event
4) The way in which loss should be recorded
5) The architecture of the loss collection process
6) The policies concerning operational events' internal disclosure.

KEY RISK INDICATOR

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EXAMPLES OF THE KEY RISK INDICATORS OF MANUFACTURING ENTERPRISES –

- Market performance, customers' feedback/complaints & competitors' performance
- Orders-in-hand and inventory
- Input-output performance
- Cycle-times (e.g. work cycle times of different activities in value-chain, order-to-delivery cycles in purchases & sales, etc)
- Suppliers' performance (in terms of delivery & quality compliance)
- Plant utilization (% usage of different machineries)
- Cost per unit of product/ service.
- Financial ratios (ROI, product profitability, capital turnover rate, liquidity ratio, debt-equity ratio, etc)

KEY RISK INDICATOR

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OTHER IMPORTANT THINGS TO CONSIDER WHILE DETERMING KRI -

1) events that might be relevant for internal operational risk management purposes
2) the so-called near misses, i.e. those events that might have provoked operational losses even if they (luckily) did not

The threshold over which losses should be recorded (with potential exception of near misses) is a particularly critical choice for risk quantification

KEY RISK INDICATOR

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RISK INDICATORS FOR BANKS.

- 1-CREDIT LOSSES FROM OPERATIONAL ERRORS(MISSING DOCUMENTATIONS,ABSENCE OF COLLATERAL IN CASE OF DEFAULT,HUMAN ERROR IN ASSESSMENT)
- 2-NEAR MISSES(THOSE EVENTS THAT MIGHT PROVOKED OPERATIONAL LOSSES EVEN IF THEY DID NOT)
- 3-THRESHOLD OVER WHICH LOSSES SHOULD BE RECCORDED
- A LOWER OR HIGH THRESHOLD SHOULD BE AVOIDED.

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BASEL MODEL

CH4 - SPM

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Basel II Accord – PILLAR 3

- Pilar 3 is about market discipline as it mainly addresses **the disclosure requirements** by Banks to complement the minimum capital requirements **(Pillar I)** and the supervisory review process **(Pillar II).**
- The purpose of Pillar 3 is to **ensure greater transparency** in terms of banks' activities and risk strategies, as well as to enhance comparability across credit institutions-which are all in the interests of market participants.
- Pillar 3 recognizes the fact that apart from regulators, banks are also **monitored by markets.**

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Basel II Accord – PILLAR 3

- It is based on the premise that markets would be quite responsive to disclosures - **the banks would be duly rewarded or penalized, in tune with the nature of disclosures, by the market forces.**
- **Pillar 3 do not entail additional capital requirements** but are limited to mandating the **publication of key data, the disclosure of which neither weakens banks' competitive positions nor violates banking secrecy**

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Basel III Accord - Overview

- Reserve Bank of India in May 02, 2012 has released its final guidelines on implementation of Basel III capital regulation in India
- These guidelines would become effective from January 1, 2013 in a phased manner.
- Basel III capital ratios will be fully implemented as on March 31, 2018.
- basel III.pdf

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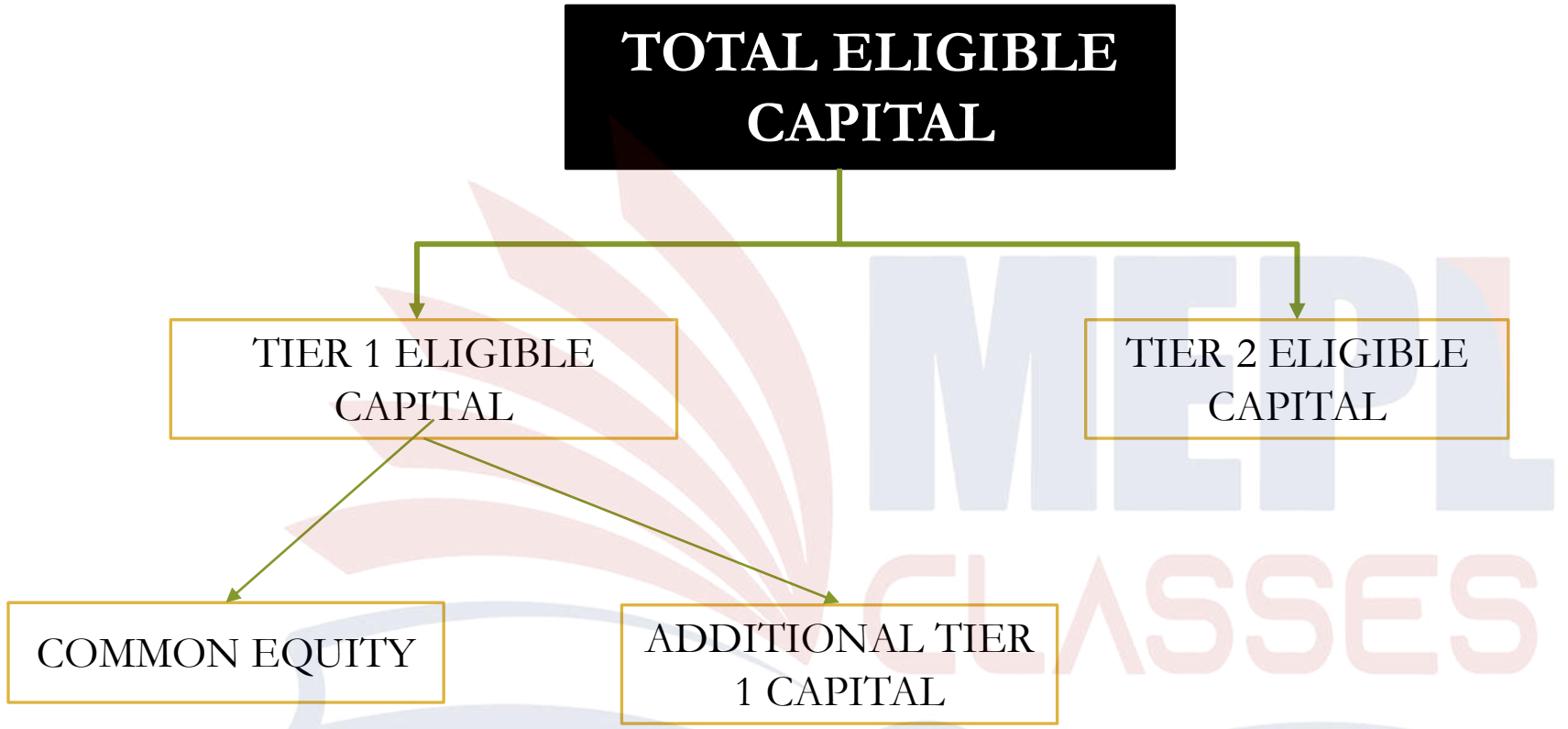
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Basel III Accord – Why?

- **The Basel III framework sets out the following:**
  - Higher and better equity capital
  - Better risk coverage
  - Introduction of a leverage ratio
  - Measures to promote the build-up of capital for periods of stress
  - Introduction of new liquidity standards

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Basel III Accord – COMMON EQUITY

"common equity" includes –
(paid up equity capital, reserves, retained earnings etc.).

In addition to raising the quality of the capital base, banks need to ensure that all material risks are captured in the capital framework. What counts as core capital may impact the Indian banking sector's competitiveness significantly.

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Basel III Accord – Various Capital Ratios

Common Equity Tier 1 capital ratio	=	$\frac{\text{Common Equity Tier 1 Capital}}{\text{Credit Risk RWA* + Market Risk RWA + Operational Risk RWA}}$
Tier 1 capital ratio	=	$\frac{\text{Eligible Tier 1 Capital}}{\text{Credit Risk RWA* + Market Risk RWA + Operational Risk RWA}}$
Total Capital (CRAR#)	=	$\frac{\text{Eligible Total Capital}}{\text{Credit Risk RWA + Market Risk RWA + Operational Risk RWA}}$

* RWA = Risk weighted Assets;
Capital to Risk Weighted Asset Ratio

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Basel III Accord – Capital Ratio Requirement by RBI

- **Common Equity Tier 1 capital ratio** = 5.5%
- **Tier 1 capital ratio** = 7%
- **Total Capital (CRAR#)** = 9%

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Basel III Accord – Liquidity Standard

- **Liquidity Coverage Ratio(LCR)—30 days**
- **Net Stable Funding Ratio(NSFR)—long term solvency**

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Basel III Accord – Credit Ratings

- High credit ratings
- Credit/GDP Ratio

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Basel III Accord – Solvency Ratio

- **Tier 1 capital/Total items on & off B/S items>3%=Bank Coverage Ratio.**

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